

The Paradox of Fight or Flight – A Leadership Guide to Understanding and Mitigating Operational Stress Injuries

Lieutenant-Colonel Philip F.C. Garbutt

Directorate of Aerospace Equipment Program Management (Maritime) 2
National Defence Headquarters
Major-General George R. Pearkes Building
Ottawa, Ontario K1A 0K2
CANADA

e-mail: garbutt.pfc@forces.gc.ca

ABSTRACT

The term operational stress injury is unique to the Canadian Forces. It defines any persistent psychological difficulty resulting from operational duties performed by a Canadian Forces member. These psychological difficulties can include mood disorders, anxiety disorders, adjustment disorders, psychotic disorders and others. Of this wide range of conditions, this paper shall focus primarily on acute and chronic stress reactions, acute stress disorder, posttraumatic stress disorder and combat stress reaction.

This paper shall demonstrate that military leaders can mitigate operational stress injuries through a system of preventive and responsive care. To demonstrate this thesis, a lexicon of stress shall be defined that embodies both a traditional and Canadian Forces conceptualization of stress reactions and disorders. The history of stress in military operations shall be examined to expose some of the time-honoured misconceptions surrounding operational stress and some of the early and important roles played by military leaders to address the problem. Following this historical analysis, the medical science behind operational stress injuries will be reviewed. Finally, having drawn upon medical science and lessons from the past, this paper shall demonstrate that military leaders can mitigate operational stress injuries through the practice of preventive care and, when prevention fails, through the facilitation of responsive treatment.

Garbutt, P.F.C. (2006) The Paradox of Fight or Flight – A Leadership Guide to Understanding and Mitigating Operational Stress Injuries. In *Human Dimensions in Military Operations – Military Leaders' Strategies for Addressing Stress and Psychological Support* (pp. 15-1 – 15-46). Meeting Proceedings RTO-MP-HFM-134, Paper 15. Neuilly-sur-Seine, France: RTO. Available from: <http://www.rto.nato.int/abstracts.asp>.

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 APR 2006		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE The Paradox of Fight or Flight A Leadership Guide to Understanding and Mitigating Operational Stress Injuries				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Directorate of Aerospace Equipment Program Management (Maritime) 2 National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario K1A 0K2 CANADA				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM001955., The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 46	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



No doubt they'll soon get well; the shock and strain
Have caused their stammering, disconnected talk.
Of course they're 'longing to go out again,' -
These boys with old, scared faces, learning to walk.
They'll soon forget their haunted nights; their cowed
Subjection to the ghosts of friends who died, -
Their dreams that drip with murder; and they'll be proud
Of glorious war that shatter'd all their pride...
Men who went out to battle, grim and glad;
Children, with eyes that hate you, broken and mad.¹
Survivors by Siegfried Sassoon

¹ Illustration (untitled) by Patrick Faricy. Siegfried Sassoon was a British poet and author who served with the Royal Welch Fusiliers during World War I. His satirical anti-war poetry reflects many of his experiences during the war. He wrote *Survivors* in the Craiglockhart War Hospital while undergoing treatment for shell shock. Joy Press, "Shell Shock and Awe," in *The Village Voice* [reference works on-line]; available from <http://www.villagevoice.com/issues/0315/press.php>; Internet; accessed 26 April 2004; see also *EnglishOpenAccess*, "Survivors," [reference works on-line]; available from http://www.stevebrown.clara.net/html/experience_of_war/sassoon_survivors.htm; Internet; accessed 15 March 2004; and *Wikipedia*, "Siegfried Sassoon," [reference works on-line]; available from http://en.wikipedia.org/wiki/Siegfried_Sassoon; Internet; accessed 26 April 2004.

1.0 INTRODUCTION

Since the mid-1990's most scientists in the field of human evolution have come to agree on a single theory of human ancestry: that every person alive today is descended from a small cluster of homo sapiens that lived in Africa about 200,000 years ago. Some astounding scientific evidence supports this seemingly radical hypothesis. Analysis of human mitochondrial deoxyribonucleic acid (DNA) from races and regions all over the planet trace back to the DNA sequencing of this single, aforementioned group in early Africa. And, given that mitochondrial DNA is inherited from the female of our species, scientists have concluded that modern man's ancestry can be linked to a solitary female within that group: the mother of modern man referred to as Mitochondrial Eve.²

Notwithstanding the obvious biblical reference, Mitochondrial Eve did not exist with a solitary male – a Mitochondrial Adam if you will – in a primordial Garden of Eden. Instead, scientists are convinced she lived amongst 20,000 of her kind, including other females. What makes the mother of modern man unique is genealogy. While the descendants of other females disappeared from the planet over time, Mitochondrial Eve's ancestry managed to survive, adapt and produce an unbroken chain of females that persists to the present date. "As a result, only Eve's mitochondria have descendant cells of living humans, and only from Eve do all living people descend along their maternal lines."³

Given this genealogy, it can be rightly argued that Mitochondrial Eve inaugurated mankind's 200,000-year legacy of survival. This capacity to elude extinction and flourish as a species was passed on in two significant ways. First, Eve's descendants inherited an instinctive system for responding to dangers and emergency. This involuntary mechanism known as the fight or flight response, equipped both the brain and body for life-threatening situations by preparing primitive man to either engage predators and enemies when conditions were favourable or flee when the threat was overwhelming.⁴ Second, Eve's lineage inherited a capacity to adapt or adjust: first, in primitive and tribal environments and then eventually in what Alvin and Heidi Toffler

² The *single-origin hypothesis* is based on the analysis of mitochondrial DNA sequencing. Referred to as the molecule of heredity, DNA is a primary chemical constituent of chromosomes. During reproduction, both parents transfer sequences or copied portions of their DNA to their offspring. A particular type of DNA - called mitochondrial DNA - is found in the mitochondria of a cell and is said to be passed to offspring by the mother. "A comparison of the mitochondrial DNA of humans from many races and regions suggests that all of these DNA sequences have evolved molecularly from a common ancestor sequence. Under the assumption that an individual inherits mitochondria only from his or her own mother, this finding implies that all living humans descend from one woman." Mitochondrial Eve is believed to have lived between 150,000 and 200,000 years ago and a family tree analysis suggests she lived in Africa. *Wikipedia*, "Mitochondrial Eve," [reference works on-line]; available from http://en.wikipedia.org/wiki/Mitochondrial_Eve; Internet; accessed 7 March 2004; see also *Wikipedia*, "Mitochondrial DNA," [reference works on-line]; available from http://en.wikipedia.org/wiki/Mitochondrial_DNA; Internet; accessed 7 March 2004.

³ The mitochondrial DNA sequencing of "pre-human" species that existed before Mitochondrial Eve – namely *Neanderthals*, *Homo habilis* and *Homo erectus* – are not consistent with the DNA of present day man. In essence, they represent separate species that eventually disappeared from the planet. Mitochondrial Eve is believed to be the first of a new species - *Homo sapiens* - that shares the DNA sequencing of modern man. *Wikipedia*, "Evolution of Homo sapiens," [reference works on-line]; available from http://en.wikipedia.org/wiki/Human_evolution#Neanderthal_Man; Internet; accessed 7 March 2004.

⁴ The *fight or flight response* is common in all animals and is not unique to *Homo sapiens*. Having said this, by virtue of the aforementioned human genealogy, modern man inherited the *fight or flight response* from Mitochondrial Eve. The terms *fight or flight response* and *fight or flight mechanism* are used synonymously throughout this paper. The terms *automatic response* and *instinctive response* are also used synonymously throughout this paper. Scott Wallace, "What is Stress," in *Virtual Psych* [reference works on-line]; available from <http://www.geocities.com/HotSprings/2987/oldsite4/whatisstress.htm>; Internet; accessed 10 March 2004.

described as agrarian, industrial and information based societies.⁵ By invention and centuries of trial and error, descendants of Mitochondrial Eve learned to overcome the physical threats to their existence. From the first sophisticated stone tools, Eve's descendants progressively developed more elaborate and reliable means of ensuring they were the hunters and not the hunted.⁶

Man has been so successful at adaptation and survival that he has all but eliminated the daily and persistent threats to physical injury that were commonplace in primitive times. "Unlike other animals, [man] can live in any climate or ecosystem, at various altitudes, and avoid the danger of predators."⁷ Yet, having overcome these threats modern life has introduced an entirely new set of stimuli that may trigger the primal fight or flight response. These more contemporary stimuli - referred to as threats and stressors - range from financial problems to marital crisis to more extreme situations of perceived threats of injury and death.⁸ The preponderance of these stimuli in modern society - many of which man can neither fight nor escape - precipitate stress and stress related disorders that affect mental and physical health.⁹ Ironically, human evolution has exposed the paradox of the fight or flight response: designed to help man to respond to life-threatening situations, this primitive defence mechanism can trigger mental and physical health conditions that are equally as life threatening.

The paradox of fight or flight has enormous implications on how man copes with potentially stressful occupations. This is true of many vocations, but none more so than today's modern military. Military operations are fraught with stressors and, as a consequence, the soldiers involved are exposed to considerable mental and physical health risks. While participants may not be physically harmed during an operation, their reaction to prolonged and traumatic stressors can elicit a broad range of stress disorders referred to collectively as operational stress injuries (OSIs). Military leaders have long recognized their obligation to

⁵ Alvin and Heidi Toffler describe three waves of human development. The first wave - societies based on agriculture - began approximately 10,000 years ago. The second wave - societies based on industry - began approximately 300 years ago. The third wave - information based societies - began in the 1970s and persists today. For the purposes of this essay, societies from the period prior to the first wave are described as either *primitive* or *tribal*. When describing the evolution of societies, the terms *era* and *wave* are used synonymously throughout this paper. Alvin Toffler and Heidi Toffler, *War and Anti-war: Survival at the Dawn of the 21st Century* (Boston: Little, Brown & Company Ltd., 1993), 9.

⁶ Scientists differentiate *Homo sapiens* from previous species by greater cranial size and overall growth in brain capacity. This increased brain capacity allowed *Homo sapiens* to develop the means to overcome and even dominant natural threats such as predators, environmental conditions and illness. *Wikipedia*, "Evolution of Homo sapiens..."

⁷ This is a general statement made of the environmental stressors present in modern societies. Of course, there still exist primitive cultures that remain at risk to environmental threats. Peter J. Panzarino, "Stress," in *MedicineNet* [reference works on-line]; available from <http://www.medicinenet.com/Stress/article.htm>; Internet; accessed 13 March 2004.

⁸ For the purposes of this essay, a *threat* is defined as: "[a]n indication of impending danger or harm." Broadly, a *stressor* is defined as: "[a]n agent, condition, or other stimulus that causes stress to an organism." More precisely, a *stressor* is a condition that introduces a *threat* that exceeds an individual's resources to respond. *The American Heritage Dictionary of the English Language*, s.v. "threat," [reference works on-line]; available from <http://www.bartleby.com/61/35/T0183500.html>; Internet; accessed 26 April 2004; *The American Heritage Dictionary of the English Language*, s.v. "stressor," [reference works on-line]; available from <http://www.bartleby.com/61/56/S0805600.html>; Internet; accessed 4 February 2004; see also Colonel Randy Boddam, telephone conversation with author, 27 April 2004.

⁹ In addition to the serious stress reactions and disorders that will be discussed in this paper, "[h]igh levels of stress contribute to health issues as diverse as depression, insomnia, heart disease, skin disorders and headaches." *NCERx Health Sites*, "Stress and Health," [reference works on-line]; available from <http://www.stress-and-health.com/index.php3>; Internet; accessed 7 February 2004.

protect their soldiers from physical injuries. It is in understanding the paradox of fight or flight that military leaders must now acknowledge their role in protecting soldiers from OSIs.¹⁰

This essay shall demonstrate that military leaders can mitigate OSIs through a system of preventive and responsive care.¹¹ To demonstrate this thesis, it is first necessary to understand the lexicon related to stress and OSIs. To this end, this paper will define terms such as stress, stress disorder, OSI, combat stress reaction, acute stress disorder and posttraumatic stress disorder. It will also be necessary to establish where – within the wide range of military operations – these stress related disorders originate. Then, this paper shall examine the history of stress in military operations to expose some of the time-honoured misconceptions surrounding operational stress and some of the early and important roles played by military leaders to address the problem. Following this historical review, the medical science behind stress and OSIs shall be examined. Finally, having drawn upon medical science and lessons from the past, this paper shall identify a system of preventive and responsive care that today's military leaders can use mitigate OSIs in their commands. While all military leaders involved in operations can certainly apply this system of treatment, this essay is directed squarely at the leadership within the Canadian Forces.¹²

2.0 THE LEXICON OF STRESS

2.1 A Traditional Conceptualization of Stress

According to Dr. Rebecca Frey, stress results from “interactions between persons and their environment that are perceived as straining or exceeding their adaptive capacities and threatening their well-being.”¹³ Whether actual or perceived, these threats provoke the biochemical fight or flight response in humans. In doing so, the body and mind prepare an individual to cope with a threatening situation.¹⁴

As stated earlier, the conditions or stimuli that elicit stress in an organism are referred to as stressors. Situations that permit a person to take action – to confront an aggressor or flee a dangerous situation for example - are considered healthy forms of stress. Unhealthy stress manifests from situations where an individual can neither fight nor flee. These unhealthy stress responses can be partitioned into two categories: *acute* and *chronic*.¹⁵

¹⁰ In the context of this essay, the term *military leaders* is used to describe a broad group of leaders in the Canadian Forces including junior leaders (Corporal to Master Corporal), senior leaders (Sergeant to Chief Warrant Officer), junior officers (2nd Lieutenant to Captain), senior officers (Major to Colonel), commanding officers of units, missions and formations and general officers (Brigadier-General to General). Department of National Defence, *Queen's Regulations and Orders for the Canadian Forces, Volume 1-Administration, Chapter 3-Rank, Seniority, Command and Precedence, Section 1-Rank and Seniority, Article 3.01 (1)* (Ottawa: Assistance Deputy Minister Finance and Corporate Services, 2003) [public document on-line]; available from http://www.forces.gc.ca/admfincs/subjects/qr_o/vol1/ch003_e.asp#3.01; Internet; accessed 18 March 2004; see also Commission of Inquiry into the Deployment of Canadian Forces to Somalia, *Dishonoured Legacy: The Lessons of the Somalia Affair - Volume 1* (Ottawa: Minister of Public Works and Government Services Canada, 1997), 43.

¹¹ The terms *essay*, *paper* and *thesis paper* shall be used synonymously throughout this document.

¹² The terms *preventive and responsive care* and *preventive and responsive measures* are used synonymously throughout this paper.

¹³ Rebecca J. Frey, “Stress,” in *HealthAtoZ Encyclopedia* [reference works on-line]; available from <http://www.healthatoz.com/healthatoz/Atoz/ency/stress.html>; Internet; accessed 12 March 2004.

¹⁴ Wallace, “What is Stress...”

¹⁵ NCERx Health Sites, “Stress and Health...”

The term *acute* refers to a condition that is either short term or in an early stage. As such, acute stress responses are transient conditions that result from exposure to stressors that range from everyday deadlines and arguments up to and including traumatic events. Acute stress responses may also be an early indicator of a chronic stress response. Symptoms of acute stress reaction include narrowing of attention, disorientation, depression, dysmnnesia, insomnia and anxiety. Acute stress reactions are described as transient because they tend to appear shortly after exposure to a transient stressor and last for a short period of time.¹⁶ The second category called chronic stress reaction occurs when stressors are constant and the body is kept on alert by continuous acute stress responses.¹⁷ Symptoms of chronic stress can be similar to acute stress however, because of its continuous nature, the symptoms of chronic stress last longer and can have serious long-term effects on health.

When individuals are confronted with a certain type of significant stressor – known as a traumatic event – acute stress reaction can manifest into a condition called acute stress disorder (ASD).¹⁸ The Diagnostic and Statistical Manual of Mental Disorders (DSM) IV defines a traumatic event as “an event or experience involving intense fear, horror, or helplessness... involv[ing] a threat of death, serious injury, or [threat to] physical integrity.”¹⁹ It is important to note that witnessing a traumatic event directed against others is sufficient to bring about ASD in the witness.²⁰

According to DSM IV, a person develops ASD within one month of a traumatic stressor with symptoms lasting at least two days but no longer than four weeks. Either during or shortly after the traumatic event, the person experiences three or more of the following dissociative symptoms: loss of emotion, numbing, or detachment, diminished awareness of surroundings, de-personalization, de-realization and amnesia. Following a traumatic stressor, a person relives the traumatic experience in one or more the following ways: through distressing recollections of the experience, reoccurring dreams, reliving the trauma in the form of flashbacks, thoughts and hallucinations, and reacting in a physiological manner to any aspect of the event or experience. A victim of ASD suffers from increased arousal, sleeping difficulties, hypervigilant behaviour, and a general avoidance of anything that might serve to remind him of the trauma. Finally, by virtue of the aforementioned symptoms, a sufferer of ASD experiences an inability to function in important societal situations such as work, home, and social gatherings.²¹

¹⁶ Acute stress reactions disappear within days, even hours. *The Clinical Research Unit for Anxiety and Depression*, “Acute Stress Reaction,” [reference works on-line]; available from http://www.crufad.org/self_help/trauma-level2.htm; Internet; accessed 12 March 2004.

¹⁷ *NCERx Health Sites*, “Stress and Health...”

¹⁸ For the purposes of this essay, the terms *traumatic event*, *traumatic stressor*, and *traumatic experience* are used synonymously. *Traumatic events* and *experiences* are *significant stressors* however, not all *significant stressors* can be considered traumatic in nature.

¹⁹ DSM IV is a system of standard classifications for mental disorders used by mental health professionals in countries including the United States and Canada. *PSYweb*, “Acute Stress Disorder,” [reference works on-line]; available from <http://www.psyweb.com/Mdisord/AnxietyDis/asd.html>; Internet; accessed 4 February 2004.

²⁰ *Ibid.*

²¹ *Dissociative symptoms* as those that disrupt the normal functioning of consciousness, identity, or memory. *De-personalization* is described as a feeling of being detached from oneself. *De-realization* is described as a feeling of not being real. *Hypervigilant* is a state of being overly sensitive to sights and sounds. *PSYweb*, “Dissociative Disorders,” [reference works on-line]; available from <http://www.psyweb.com/Mdisord/dissd.html>; Internet; accessed 4 February 2004; see also *PSYweb*, “Depersonalization,” [reference works on-line]; available from <http://www.psyweb.com/Diction/deperson.html>; Internet; accessed 4 February 2004; *PSYweb*, “Derealization,” [reference works on-line]; available from <http://www.psyweb.com/Diction/dereal.html>; Internet; accessed 4 February 2004; *PSYweb*, “Hypervigilant,” [reference works on-line]; available from <http://www.psyweb.com/Diction/hypervi.html>; Internet; accessed 4 February 2004; and *PSYweb*, “Acute Stress Disorder...”

Traumatic stressors can also bring about a second condition referred to as posttraumatic stress disorder (PTSD). While there is significant overlap between ASD and PTSD, in general, ASD is distinguished from PTSD in two ways: the time frame in which symptoms become apparent and the diagnostic criteria. According to DSM IV, PTSD typically develops within three months of a traumatic stressor and the symptoms last a minimum of one month. Although less common, DSM IV also identifies cases of delayed onset PTSD where symptoms materialize six months (or more) after the traumatic experience.²²

In accordance with DSM IV, an individual suffering from PTSD re-experiences the trauma in one or more of the following ways: through intrusive, reoccurring and distressful recollections and dreams of the trauma, by reliving the event through flashbacks, hallucinations, or illusions, by suffering intense psychological distress when exposed to any aspect of the trauma and by reacting in a physiological manner to any aspect of the event or experience.²³ As with ASD, a victim of PTSD suffers from increased arousal and may avoid things that might remind him of the traumatic experience or event.

However, the diagnostic criteria for PTSD are noticeably more demanding. In terms of increased arousal, a PTSD victim must persistently exhibit at least two of the following symptoms: difficulty falling and remaining asleep, irritability and sudden outbursts of anger, lack of concentration, hypervigilance, and an exaggerated startle response. In terms of avoidance, a victim of posttraumatic stress may steer clear of things they perceive as connected with the trauma and exhibit an overall numbing of responsiveness. In addition, the victim must exhibit at least three of the following symptoms: an avoidance of any thoughts or feelings about the trauma, an avoidance of people, places, and things that might arouse memories of the trauma, an inability to recall important facts surrounding the experience, a marked disinterest in important activities, feelings of either detachment or alienation, a loss of feelings of affection, and the general sentiment of having no future.²⁴

Figure 1 provides a traditional conceptualization of the types of disorders that can result from stress. An individual exposed to acute and chronic stressors can experience a wide variety of general stress conditions such as headaches, depression, anxiety and insomnia. When exposed to significant stressors, an individual may experience the aforementioned general stress conditions or one of two subsets: ASD or PTSD.

²² There is considerable overlap between ASD and PTSD. In fact, ASD was developed to as a predictor for individuals who would, in all likelihood, go on to develop PTSD. While this essay presents ASD and PTSD as two disorders with significant overlap, they can also be considered as different stages of a single disorder. Depending on the source, PTSD is spelled-out as either *posttraumatic stress disorder* or *post-traumatic stress disorder*. The former (*posttraumatic stress disorder*) is used in DSM IV and shall be used in this essay. Alternate forms found in quotations shall be left unchanged. *PSYweb*, "Posttraumatic Stress Disorder," [reference works on-line]; available from <http://www.psyweb.com/Mdisord/AnxietyDis/posttraumatic.html>; Internet; accessed 4 February 2004.

²³ Ibid.

²⁴ Ibid.



Figure 1: A Traditional Conceptualization of Stress. Traditionally, acute and posttraumatic stress disorders are conceptualized as a subset of a broader set of general stress conditions. This model illustrates the considerable overlap between ASD and PTSD. **Note:** The ASD and PTSD subsets are not presented to scale in relation to the broader set of general stress conditions. In actuality, the ASD and PTSD subsets would be much smaller and there would be considerably more overlap between the two conditions.

2.2 The Canadian Forces Conceptualization of Stress

The definitions of threats and stressors, stress and stress reactions, ASD and PTSD are significant and familiar to the civilian psychiatric community. And, while they are relevant to military psychiatry as well, there exists a unique Canadian Forces conceptualization of stress that embodies these definitions and what is known as the spectrum of conflict.

The Canadian Forces defines the spectrum of conflict “as the varying states of relations between nations or groups.”²⁵ As illustrated in Figure 2, relationships between states and non-state entities exist in conditions of peace, conflict and war. This is to say that state and non-state interaction can take place in the absence of violence (peace), under the threat or in the midst of violence (conflict) and during armed hostilities between parties (war). In order to influence the behaviour of other states, the Canadian government has at its disposal a number of instruments of national power. In broad categories, these instruments include diplomatic, economic, political and military measures.²⁶ If the Government of Canada chooses a military response to

²⁵ Department of National Defence, B-GG-005-004/AF-000 *Canadian Forces Operations* (Ottawa: DND Canada, 2000), 1-3.

²⁶ The term *instrument of national power* is used to describe a means by which a national government can influence the behaviours of other state governments. Ibid.

exact this influence, this does not automatically imply the government has opted for a violent course of action. As illustrated in Figure 2, the strategic military response can include operations other than war (OOTW) – which consist of non-combat and combat operations - and war fighting operations that are exclusively combat operations.²⁷

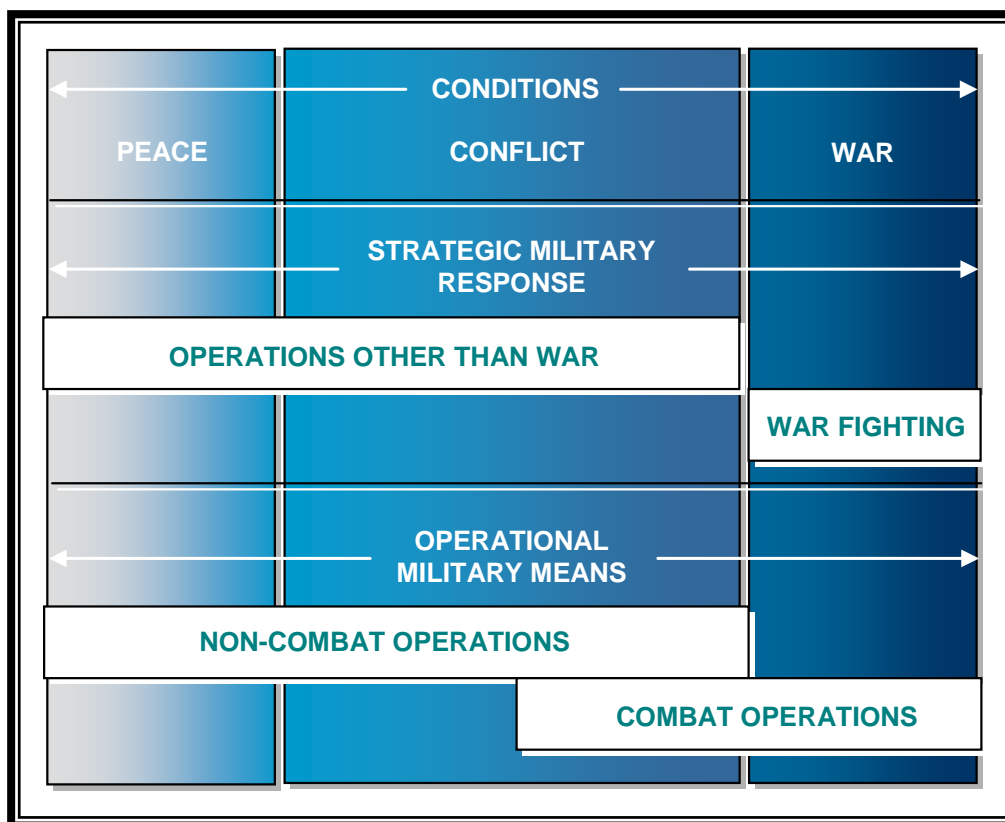


Figure 2: The Spectrum of Conflict. Department of National Defence, *Canadian Forces Operations...*, 1-4.

A military operation is either “the action or the carrying out of a strategic, tactical, training or an administrative military mission” or “the process of carrying on combat, including movement, supply, attack defence and manoeuvres needed to gain the objectives of any battle or campaign.”²⁸ Military units are employed to achieve the objectives of an operation. At any given time a military unit – and the soldiers within a military unit - can typically be described as being involved in one of the following states within the cycle of

²⁷ The *strategic military level* is defined as “that level at which a nation or group of nations determines national or alliance security objectives and develops and uses national resources to accomplish objectives.” In Canada, the strategic military level is located at National Defence Headquarters. The *operational level* is defined as “the level at which campaigns and major operations are planned, conducted and sustained to accomplish strategic objectives.” A military operation is defined “as a military action or the carrying out of a strategic, tactical, training or an administrative mission.” The *tactical level* is defined as the level at which battles and engagements are planned and executed to accomplish military objectives. For the purposes of this essay, military leaders – previously identified as junior leaders, senior leaders, junior officers, senior officers, commanding officers of units, missions and formations and general officers – can lead at the strategic, operational and tactical levels. As a consequence, military leaders can be described as *strategic level leaders*, *operational level leaders*, and *tactical level leaders*. Ibid., 1-4-1-5.

²⁸ Ibid., 1-3.

employment: pre-deployment (activities in preparation for an operation), deployment (participation in an operation), post-deployment (activities following an operation).²⁹

In non-combat OOTW, military personnel and equipment are employed to achieve strategic and operational objectives. When these missions are executed in peaceful conditions, weapons may or may not be readily available. However, if weapons are present, their use is governed by clearly delineated rules of engagement.³⁰ In a peaceful international context, non-combat OOTW include humanitarian and peacekeeping missions conducted under the auspices of Chapter VI of the United Nations Charter.³¹

There is also a domestic component to non-combat OOTW where military personnel and equipment are employed to aid civil authorities in regional emergencies and disaster relief. The Canadian Forces response to the 1997 Red River floods (Operation ASSISTANCE), the 1998 ice storm in Quebec and Ontario (Operation RECUPERATION), the 2003 forest fires in British Columbia (Operation PEREGRINE) and the 1998 Swiss Air disaster (Operation PERSISTENCE) are all examples of domestic OOTW.³²

Non-combat OOTW can also be conducted under conditions of conflict where there is the potential for violence. Some of these missions are planned as non-combat operations where efforts are made to assist another state while avoiding violent conflict. As a consequence, weapons are present but their use is governed by clearly delineated rules of engagement. From an international perspective, this type of OOTW can include

²⁹ The term *soldier* is used to describe any member within a military force regardless of environmental affiliation. For the purposes of this essay, the term *soldier* is taken to be synonymous with *airman*, *sailor* and *warrior*. The terms *phases* and *stages* are used synonymously throughout this paper. The explanation of the employment cycle provided in this essay differs slightly from the process defined in B-GG-005-004/AF-000 *Canadian Forces Operations*. Having said this, the employment cycle presented in this paper is consistent with the model presented by Thompson and Pastò. Megan M. Thompson and Luigi Pastò, "Psychological Interventions in Peace Support Operations: Current Practices and Future Challenges," in *The Psychology of the Peacekeeper – Lessons from the Field*, ed. Thomas W. Britt and Amy B. Adler (Westport: Praeger Press, 2003), 224-225.

³⁰ Department of National Defence, *Canadian Forces Operations*..., 1-3.

³¹ Chapter VI of the United Nations Charter describes the process for the peaceful settlement of international disputes. Military OOTW can be initiated under Article 36 which states: "The Security Council may, at any stage of a dispute ... recommend appropriate procedures or methods of adjustment." Under such conditions Article 38 states: "the Security Council may, if all the parties to any dispute so request, make recommendations to the parties with a view to a pacific settlement of the dispute." Office of the Judge Advocate General, "1945 Charter of the United Nations, Chapter VI- Pacific Settlement of Disputes," in *Collection of Documents on the Law of Armed Conflict*, 2001 ed., ed. Directorate of Law Training (Ottawa: DND, 2001), 59-60.

³² During Operations ASSISTANCE (Manitoba Floods – 21 April to 19 May 1997), RECUPERATION (Ontario, Quebec and New Brunswick Ice Storm – 8 January to 8 February 1998) and PEREGRINE (British Columbia Forest Fires – 3 August to 16 September 2003) the Canadian Forces provided aid to civil powers to help deal with natural disasters. During Operation PERSISTENCE, the Canadian Forces provided assistance to federal agencies and the Government of Nova Scotia following the crash of Swiss Air Flight 111 on 2 September 1998. The operation involved the employment of Navy, Army, and Air Force personnel and equipment over two weeks to recover the remains of the 229 passengers and crew in the waters off of the coast of Peggy's Cove, Nova Scotia. Department of National Defence, *Operation ASSISTANCE* (Ottawa: Assistant Deputy Minister (Public Affairs), 2002) [public document on-line]; available from http://www.forces.gc.ca/site/Operations/assistance_e.asp; Internet; accessed 14 March 2004; see also Department of National Defence, *Operation RECUPERATION* (Ottawa: Assistant Deputy Minister (Public Affairs), 2002) [public document on-line]; available from http://www.forces.gc.ca/site/Operations/recuperation_e.asp; Internet; accessed 14 March 2004; Department of National Defence, *Operation PEREGRINE* (Ottawa: Assistant Deputy Minister (Public Affairs), 2002) [public document on-line]; available from http://www.forces.gc.ca/site/Operations/Peregrine/index_e.asp; Internet; accessed 14 March 2004; and Department of National Defence, *Operation PERSISTENCE* (Ottawa: Assistant Deputy Minister (Public Affairs), 2002) [public document on-line]; available from http://www.forces.gc.ca/site/operations/persistence_e.asp; Internet; accessed 14 March 2004.

those previously identified under Chapter VI of the United Nations Charter.³³ However, there is also an area of overlap in Figure 2 where there may be violence and a requirement for combat in OOTW but this requirement is either unclear or unspecified at the outset of the operation. Lieutenant-General Romeo Dallaire referred to this grey area as United Nations “chapter six and a half operations”. During the humanitarian crisis in Rwanda in 1994, Dallaire commanded the United Nations Assistance Mission for Rwanda (UNAMIR) and witnessed the genocide that erupted between state parties, non-state parties and the civilian population. Although conducted under the auspices of a Chapter VI mandate, Dallaire argued that the UNAMIR mission should have changed to “chapter six and a half” at the outset of the genocide in order “to take aggressive action to prevent crimes against humanity as well as in self-defence.”³⁴ While Dallaire’s remarks remain a matter of debate, his experiences during UNAMIR highlight the fact that classical peacekeeping operations can rapidly degenerate into situations that merit both self-defence and the application of force.³⁵

This naturally leads to the next type of military response in the spectrum of conflict: OOTW involving combat. Combat operations are those operations “where the use of force or threatened use of force is essential to accomplish a mission.”³⁶ Weapons are present in combat operations and authority for their use in conflict is governed by rules of engagement. However, once armed conflict commences, the laws of armed conflict also govern conduct.³⁷ Combat OOTW include peace enforcement and maritime interdiction operations conducted under the sponsorship of an alliance such as the North Atlantic Treaty Organization or under the auspices of Chapter VII of the United Nations Charter.³⁸

The final category of military response – namely war fighting – takes place in an environment of war or what Toffler and Toffler called “a bloody clash between organized states.”³⁹ Weapons are obviously present in war fighting and conduct of operations is governed by the laws of armed conflict.⁴⁰

It is in understanding this spectrum of conflict that one can re-define the lexicon of stress in a manner unique to the Canadian Forces (see Figure 3.0). The broad area of general stress disorders previously illustrated in

³³ The major difference between military operations in peaceful conditions and conditions of conflict is the assessment of the threat to the Canadian Forces. In the latter instance, the threat assessment will be greater and hence, Canadians will take greater security precautions and have more robust rules of engagement to address potential threats.

³⁴ Roméo Dallaire, *Shake Hands with the Devil – The Failure of Humanity in Rwanda* (Toronto: Random House of Canada Ltd., 2003), 359-360.

³⁵ When General Dallaire was initially notified of his mission in Rwanda, General Armand Roy (Land Forces Commander Quebec Area) described UNAMIR as a classical peacekeeping operation. Dallaire, *Shake Hands with the Devil...*, 43.

³⁶ Department of National Defence, *Canadian Forces Operations...*, 1-3.

³⁷ The law of armed conflict “determines when states may resort to the use of armed force and how they may conduct hostilities during armed conflict.” Department of National Defence, B-GG-005-027/AF-021 *The Law of Armed Conflict at the Operational and Tactical Level* (Ottawa: DND Canada, 2001), 1-1.

³⁸ Chapter VII of the United Nations Charter describes actions to resolve threats to peace, breaches of peace, and acts of aggression. Military OOTW can be initiated under Article 42 which states the Security Council “may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security. Such action may include demonstrations, blockades, and other operations by air sea or land forces of Members of the United Nations.” Office of the Judge Advocate General, “1945 Charter of the United Nations, Chapter VII- Action with Respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression, Article 42” in *Collection of Documents on the Law of Armed Conflict*, 2001 ed., ed. Directorate of Law Training (Ottawa: DND, 2001), 60.

³⁹ Given the recent war against terrorism, this definition of war can be expanded to include clashes with non-state parties such as terrorist groups. Toffler and Toffler, *War and Anti-war...*, 33.

⁴⁰ Department of National Defence, *The Law of Armed Conflict...*, 1-1.

Figure 1 is captured in the Canadian Forces' vernacular by the term OSI. According to Veteran's Affairs Canada, the term OSI was developed by Canada's Department of National Defence to describe "a number of conditions resulting from military trauma, including post-traumatic stress disorder (PTSD), depression, anxiety, and addictions, among others."⁴¹ The Operational Stress Injury Social Support (OSISS) Project officially defines OSI as "any persistent psychological difficulty resulting from operational duties performed by a Canadian Forces member."⁴² According to Colonel Randy Boddam, OSIs cover a broad range of stress related disorders that can be experienced as a result of combat and non-combat operations.⁴³ In essence, in coining the term OSI, the Canadian Forces has taken the concept of general stress disorders and applied it across the full spectrum of conflict.



Figure 3: The Canadian Forces Conceptualization of Stress. Under the Canadian Forces conceptualization of stress ASD, PTSD and CSR are subsets of OSIs. This model illustrates the considerable overlap between ASD, PTSD and CSR. Note: The ASD, PTSD, and CSR subsets are not presented to scale in relation to the broader OSI set. In actuality, the ASD, PTSD and CSR subsets would be much smaller and there would be considerably more overlap between the three conditions.

⁴¹ Veteran Affairs Canada, *VAC Clients – Filling the Gaps at The Centre* (Ottawa: Veteran Affairs Canada, 2003) [public document on-line]; available from <http://www.vac-acc.gc.ca/clients/sub.cfm?source=forces/cfcentre>; Internet; accessed 4 February 2004.

⁴² The VAC and OSISS definitions of OSI encompass a wide range of conditions including mood disorders, anxiety disorders, adjustment disorders, psychotic disorders and others. This essay shall focus primarily on stress reactions, ASD, PTSD and CSR. *Operational Stress Injury Social Support*, "OSI Official Definition," [reference works on-line]; available from http://www.osiss.ca/engraph/OSI_Official_e.asp; Internet; accessed 19 March 2004.

⁴³ Colonel Randy Boddam is currently working in Ottawa as the Clinical Team Leader for the Mental Health Team of Rx2000, the Canadian Forces Health System renewal project. Colonel Boddam participated in Critical Incident Stress Debriefings in Croatia and Cyprus and was involved in mental health visits to Bosnia and Afghanistan. In 1996, he was appointed Clinical Advisor to the Surgeon General for Psychiatry and is now the Canadian Forces Practice Leader for Psychiatry and Mental Health. Colonel Randy Boddam, telephone conversation with author, 30 October 2003.

The terms ASD and PTSD have also found their way into the Canadian Forces lexicon of stress. Having said this, it is important to note that these disorders do not just result from traumatic stressors experienced in combat operations. As pointed out by Vice-Admiral Garry Garnett in an interview with the Canadian Broadcast Corporation, they can result from traumatic experiences during domestic peacetime operations and as well as non-combat operations.⁴⁴ Therefore, in the Canadian Forces vernacular, ASD and PTSD form unique subsets of the broader category of OSIs that can result from operations across the full spectrum of conflict.

Many militaries - including the Canadian Forces - recognize a stress disorder exclusive to combat operations known as combat stress reaction (CSR). While the history behind this expression will be elaborated upon later, at this stage in the essay it is important to note that a soldier's reaction to the stresses experienced during war has had many names, interpretations and definitions.⁴⁵ One of the more recent descriptions written by Zahava Solomon defines CSR as: "the breakdown [that] is the result of the massive stress to which the soldier is exposed."⁴⁶ According to Solomon, CSRs result primarily from the threat of personal death or injury. However, she concedes that CSR may come about from the sight of death and injury to others, sleep and nutritional deprivation, prolonged exposure to field conditions and the absence of support systems.⁴⁷

Along a similar line, Boddam describes CSR as an individual's reaction to either prolonged stressors experienced during combat operations or a single and severe stressor. Not surprisingly, he states CSR share many of the symptoms associated with ASD and PTSD including: hypervigilance, an exaggerated startle response, a decreased responsiveness to the environment, disruption of the normal functioning of consciousness, identity, or memory, a diminished capacity to care for oneself, trembling, confused and disorganized personal behaviour, and nightmares.⁴⁸ As illustrated in Figure 3, CSR can be summarized in Canadian Forces vernacular as a type of OSI that manifests as a result of combat operations that shares many of the symptoms of ASD and PTSD.

Of course OSI, ASD, PTSD and CSR are all relatively recent terms. It is important to recognize that the lexicon of stress introduced in this essay has developed over centuries. And, throughout this evolution, mankind has experimented with various means to treat victims of operational stress. Since some of these methods have been successful and others have failed, it is useful to understand why. More importantly, an examination of the history of operational stress will identify the major lessons that can be applied today to help mitigate OSIs.

3.0 THE HISTORY OF STRESS

In *War and Anti-war*, Toffler and Toffler state that human conflict dates back to the earliest tribal communities.⁴⁹ Their contention is supported by Dr. John Ellard who states: "It is a reasonable assumption

⁴⁴ Canadian Broadcasting Corporation, "The National - The Unseen Scars - Post Traumatic Stress Disorder," [reference works online]; available from <http://www.tv.cbc.ca/national/pgminfo/ptsd/wounds.html>; Internet; accessed 14 March 2004.

⁴⁵ The term *combat stress reaction* has also been called *nostalgia*, *hysteria*, *shell shock*, and *battle exhaustion*. The history, interpretations and definitions of these terms shall be discussed in detail in Chapter 3 of this paper.

⁴⁶ Zahava Solomon, *Combat Stress Reaction: The Enduring Toll of War* (New York: Plenum Press, 1993), 30.

⁴⁷ Ibid.

⁴⁸ Colonel Randy Boddam, *Operations and the Mind*, presented by author at the Canadian Forces College, Toronto, August 2003.

⁴⁹ Toffler and Toffler, *War and Anti-war...*, 31.

that the various tribes of *Homo sapiens* have been at war with each other for most of the time since they came down from the trees.”⁵⁰ Given this early relationship with conflict and knowing what we do about the human reaction to significant stressors in war, it is safe to assume that stress reactions in *Homo sapiens* - what we now call CSR - date back as far as Mitochondrial Eve.⁵¹

Of course, Mitochondrial Eve and her immediate descendants did not spend a great deal of time documenting their reactions to conflict and stress. In fact, descriptions of stress related reactions have appeared only recently in human history. Walter Alvarez identified one of the earliest references to combat stress in this quote from King Sennacherib of Assyria:

The vehemence of my battle line like a bull overwhelmed them ... to save their lives they trampled over the bodies of their soldiers ... with their urine they defiled their chariots and lost their excrements.⁵²

The first known references to stress reactions appeared toward the end of what Toffler and Toffler called the agrarian wave of human history.⁵³ In 1569, a Swiss officer noted a type of homesickness that afflicted his cadets. Around the same period of time French practitioners made comparable observations labelling this condition of deep despair as “maladie du pays.”⁵⁴ But it was a Swiss doctor by the name of Johannes Hofer who published the first medical article on the subject of stress disorders in 1678.⁵⁵ Hofer used the term “nostalgia” to describe what he observed as a condition of sadness resulting from being away from one’s native homeland. While much of Hofer’s work focused on civilians, he did make specific reference to military patients.⁵⁶ Those suffering from nostalgia “took on a lifeless and haggard countenance, became indifferent to their surroundings, confused past and present, and even hallucinated voices and ghosts.”⁵⁷

Hofer described nostalgia as a serious disorder that – when left untreated – could potentially result in death. However, he also noted that if the circumstances that precipitated the nostalgic condition changed, the disorder disappeared.⁵⁸

⁵⁰ John Ellard, “Principles of Military Psychiatry,” *ADF Health* 1, no. 2 (April 2000) [journal on-line]; available from http://www.google.ca/search?q=cache:IrUMhcde68cJ:www.defence.gov.au/dpe/dhs/infocentre/publications/journals/NoIDs/ADFHealthApr00/ADFHealthApr00_1_2_8184.pdf+principles+of+military+psychiatry+%2B+john+ellard&hl=en&ie=UTF-8; Internet; accessed 14 March 2004.

⁵¹ As previously stated, the *fight or flight mechanism* is common in all animals and is not unique to *Homo sapiens*. However, given that modern man inherited this response from the first *Homo sapien* - Mitochondrial Eve - it is reasonable to conclude that stress reactions in *Homo sapiens* have existed since that time.

⁵² Walter C. Alvarez, *Nervousness, Indigestion and Pain* (New York: Paul B. Hoeber Inc., 1943), 3, quoted in Ellard, “Principles of Military Psychiatry...”

⁵³ Toffler and Toffler describe the agrarian era as beginning with the agricultural revolution approximately 10,000 years ago and ending in the late 1600s. Toffler and Toffler, *War and Anti-war...*, 9.

⁵⁴ Ed Brown, “Notes on Nostalgia,” in *Brown University* [reference works on-line]; available from <http://bms.brown.edu/HistoryofPsychiatry/nostalgia.html>; Internet; accessed 4 February 2004.

⁵⁵ Allan D. English, “Leadership and Operational Stress in the Canadian Forces,” *Canadian Military Journal* 1, no. 3 (Autumn 2000): 35.

⁵⁶ Brown, “Notes on Nostalgia...”

⁵⁷ Craig Lambert, “Hypochondria of the Heart,” *Harvard Magazine* 104, no. 1 (September-October 2001) [journal on-line]; available from <http://www.harvard-magazine.com/on-line/0901214.html>; Internet; accessed 4 February 2004.

⁵⁸ *Ibid.*

These agrarian era theories and treatments reflected a general ignorance of the causes of stress injuries. A century after Hofer's first publication, nostalgia was commonly considered a form of mental illness. Soldiers considered most susceptible to this condition lacked strength, willpower and self-control.⁵⁹ To remedy a nostalgic patient, doctors prescribed purging, opium, leeches, and hypnotic emulsions. Less sympathetic methods employed by military leaders reflected the overall sense of derision that many had for nostalgic soldiers. In 1733 for example, a Russian officer purportedly buried a nostalgic soldier alive in an attempt to mitigate a growing epidemic amongst his troops.⁶⁰

For the most part, agrarian era descriptions of what are now called OSIs were limited in numbers and were largely related to a patient's separation from home. Notwithstanding their limitations, an important lesson for military leaders looking to mitigate OSIs can be drawn from these accounts: in some individuals, separation from their routine and home environment for the purposes of military operations was a sufficient enough stressor to produce debilitating stress injuries.

While the agrarian wave provided man's first records of stress injuries, the transition to what Toffler and Toffler called the industrial wave of human history introduced far better recording and analysis of stress reactions.⁶¹ The industrial revolution that began in the late 1600s introduced unprecedented levels of nostalgia due largely to an important change in warfare: "the conscription of mass armies paid by and loyal ... to the modern nation-state."⁶² The French were the first to institute conscription in 1793 – commonly referred to as a *levée en mass*. This concept of mobilization proved so successful that the French formed an army of approximately 750,000 men in under a year.⁶³ While conscription revolutionized warfare in Europe, mass mobilization brought with it an entirely new set of stressors for soldiers. French Army units became overwhelmed with conscripts from remote locations. These units were poorly administered and equipped and frequently inactive for long periods of time. As a result, the conscript soldier faced the possibility of nostalgia due to low morale and idleness. Not surprisingly, cases of *maladie du pays* were prevalent throughout the Napoleonic Era (1792-1802), but they reached near epidemic levels both during and following periods of inactivity and military defeat when soldiers had difficulty changing or adapting to the conditions.⁶⁴

In the 19th century, the industrial revolution ushered in another critical change in warfare: mass firepower of artillery and rapid-fire weapons. Toffler and Toffler write of this evolution: "the 'machine age' gave birth to the machine gun, to mechanized warfare, and to entirely new kinds of firepower."⁶⁵ The American Civil War (1861-1865) was the first major conflict that involved both mass mobilization and mass firepower and, as a result, it proved to be an austere precursor to the First World War. Nostalgia remained in vogue as a medical diagnosis throughout the American Civil War and "[a]fter insanity, nostalgia was the second major disgnostic [*sic*] category used ... to describe what we would think of today as a stress disorder."⁶⁶ However, given the

⁵⁹ Brown, "Notes on Nostalgia..."

⁶⁰ Craig Lambert, "Hypochondria of the Heart..."

⁶¹ Toffler and Toffler, *War and Anti-war...*, 38.

⁶² Ibid.

⁶³ The terms *conscription* and *mobilization* are used synonymously throughout this paper. *Columbia Encyclopedia*, "French Revolutionary Wars," [reference works on-line]; available from <http://www.bartleby.com/65/fr/FrenchReWr.html>; Internet; accessed 7 February 2004.

⁶⁴ Brown, "Notes on Nostalgia..."

⁶⁵ Toffler and Toffler, *War and Anti-war...*, 40.

⁶⁶ Brown, "Notes on Nostalgia..."

mass firepower introduced during the Civil War, it is likely that many of the cases labelled as either insanity or nostalgia were induced by far more than mere homesickness. In his book *From Shell Shock to Combat Stress*, Hans Binneveld points out that while there was considerable interest in the nostalgic condition amongst the American military, the United States never established a psychiatric service to care for and evaluate nostalgic patients during the Civil War.⁶⁷ As a consequence, the world would have to wait until the horrific events of World War I to further develop an understanding of stress injuries.

Between the American Civil War and World War I, the mass and lethality of firepower increased. Binneveld states that the most striking improvement was in the field of artillery: “[b]oth the explosive force of the shells and the distances over which they could be delivered increased at a rapid pace... The capacity to put the enemy out of commission thereby increased enormously.”⁶⁸ Developments in artillery were matched by innovations in hand-held weapons for the infantry including the patenting of the Gatling gun and smokeless gunpowder.⁶⁹ According to Binneveld, this revolution in artillery and firearms forced armies to abandon the tactics of closed, neat formations in favour of more dispersed deployments of troops. Robbed of the sanctuary of distance and shelter, armies were forced to dig into the ground to escape the lethal effects of mass firepower. What resulted was the horror of trench warfare experienced between 1914 and 1918.⁷⁰

From the outset of World War I, cases of stress related conditions flooded military hospitals. Most involved exposure to intense artillery bombardment, death and near-death experiences and prolonged exposure to trench warfare that soldiers simply could not escape. In many cases the symptoms exhibited - such as memory loss, impaired senses (sight, smell, taste, hearing) and muscle spasms – seemed to suggest something much different than nostalgia.⁷¹ As a consequence, a new term - hysteria - replaced nostalgia to describe these cases.

The phenomenon of hysteria was initially studied in the 1880’s by Jean Martin Charcot, a professor of neuropathology at the Salpetriere hospital and asylum in Paris. Charcot argued that hysteria was a biological disease - “an illness of the mind when there was nothing wrong with the body.”⁷² To cure nervous diseases such as hysteria, Charcot advocated periods of prolonged hospitalization referred to as asylum therapy.⁷³

By World War I, Charcot’s assertion that hysterical patients were suffering from a disease was a prevalent theory amongst the military services in Britain and Canada. According to Dr. Alan English, British and Canadian armies categorized hysteria as a disease “believed to be caused by a lack of will power, laziness or moral depravity.”⁷⁴ As in the agrarian era accounts of stress injuries, theories of hysteria during this period demonstrated a general misinterpretation of the condition and reflected the overall feeling of derision that the military community had for the victims.

⁶⁷ Hans Binneveld, *From Shell Shock to Combat Stress*, trans. John O’Kane (Amsterdam: Amsterdam University Press, 1997), 4.

⁶⁸ *Ibid.*, 28.

⁶⁹ *The War Scholar*, “A Summarized History of the Development of Military Technology,” [reference works on-line]; available from <http://www.warscholar.com/Year/TechnologyOutline.html>; Internet; accessed 5 March 2004.

⁷⁰ Binneveld, *From Shell Shock to Combat Stress*..., 44.

⁷¹ *Ibid.*, 84.

⁷² *Middlesex University*, “Jean Martin Charcot and Blanche Wittman,” [reference works on-line]; available from <http://www.mdx.ac.uk/www/study/ycharcot.htm>; Internet; accessed 7 February 2004.

⁷³ *Ibid.*

⁷⁴ English, “Leadership and Operational Stress...”, 35.

In the absence of a unique military approach to hysteria early in the war, hysteric soldiers were treated in a manner consistent with the civilian practices promoted by Charcot. As such, soldiers were evacuated from the frontlines and transferred to civilian hospitals in Britain. As English points out, this practice proved largely unsuccessful. While most soldiers overcame the outward physical symptoms of hysteria, for many the root causes remained unresolved. As a consequence, many of these young men were institutionalized.⁷⁵

The lexicon of stress and approaches to stress injuries were forever changed in 1915 when Charles Myers, a Captain and doctor in the Royal Army Medical Corps, published an article entitled “Contribution to the Study of Shell Shock.” In this article, Myers described three soldiers suffering from similar disorders – memory loss, impaired senses and paralysis – all as a result of exposure to artillery shelling.⁷⁶ Myers theorized that the symptoms of shell shock were consistent with hysteria. Moreover, the fundamental assumption of his work “was that the senses and the brain could be injured by the explosion of artillery shells.”⁷⁷ However, according to Strecker and Appel post-mortem brain examinations in deceased shell shock victims and the emergence of such victims who had no contact with artillery explosions inevitably disproved Myers’ hypothesis.⁷⁸ Nonetheless, the term shell shock stands as what Binneveld calls “the most famous special term to emerge from the history of military medicine.”⁷⁹

Still, Myers did much more than coin a catchy phrase for stress injuries. Author Ben Sheppard contends that Myers’ work and publications between 1915 and 1916 served to convince sceptics that shell shock was “distinct from the traditional categories of wounded, sick, well or mad.”⁸⁰ According to Professor Joanna Bourke, the efforts of medical officers like Myers helped us recognize “that everyone had a breaking point: weak or strong, courageous or cowardly - war frightened everyone witless.”⁸¹

Myers also managed to persuade the British Army to reconsider the practice of evacuating shell shock victims back to institutions in England. Myers argued strongly for the creation of specialized medical facilities in France so that shell shock victims would not be exposed to either the humiliation associated with an institution for the legitimately insane or the mockery commonly experienced in medical hospitals. While the practice of evacuating patients back to England was never completely abandoned, Myers’ efforts led to the first shell shock treatment facilities in Boulogne in 1916 and, later in the war, to specialized hospitals located in close proximity to the front.⁸² It was this concept of treating soldiers close to the battle lines – referred to as proximity – that led to the establishment of the basic principles of military psychiatry: proximity, immediacy and expectancy.

⁷⁵ Allan D. English, “Historical and Contemporary Interpretations of Combat Stress Reaction,” (Dissertation, Royal Military College, 1999), 2.

⁷⁶ Charles S. Myers, “A Contribution to the Study of Shell Shock,” *The Lancet*, (February 1915): 316-320, quoted in Ed Brown, “Myers,” in *Brown University* [reference works on-line]; available from <http://bms.brown.edu/HistoryofPsychiatry/Myers.html#Comment>; Internet; accessed 7 February 2004.

⁷⁷ Binneveld, *From Shell Shock to Combat Stress...*, 86.

⁷⁸ Edward A. Strecker and Kenneth E. Appel, *Psychiatry in Modern Warfare* (New York: The Macmillan Company, 1945), 22-23.

⁷⁹ Binneveld, *From Shell Shock to Combat Stress...*, 85.

⁸⁰ Ben Sheppard, *A War of Nerves: Soldiers and Psychiatrists in the Twentieth Century* (Cambridge: Harvard University Press, 2001), 27.

⁸¹ *BBCi History*, “Shell Shock during World War One,” [reference works on-line]; available from http://www.bbc.co.uk/history/war/wwone/shellshock_03.shtml#top; Internet; accessed 15 March 2004.

⁸² Sheppard, *A War of Nerves...*, 27.

The French perfected these principles in the last two years of the war although, as Binneveld states, their success was largely a matter of trial and error. For example, the positive effect of proximity on patient recovery did not originate from medical theory. Instead, French doctors stumbled upon the principle when casualty levels necessitated the construction of hospitals at increasingly closer distances to the front lines. The principles of immediacy and expectancy developed in much the same manner.⁸³ Notwithstanding this haphazard start, by the end of World War I, the French had developed a system of care that was based upon the principles that “[d]istressed soldiers are treated close to the battlefield (proximity), as soon as possible (immediacy), and with full expectation that they will return to duty (expectancy).”⁸⁴

While the agrarian era made a limited contribution to our knowledge of stress injuries, the exact opposite can be said of the industrial era up to the end of the First World War. The restrictive diagnosis of nostalgia – a condition largely attributed to homesickness – was supplanted early in the industrial era by the more comprehensive diagnosis of hysteria and, later shell shock. These new conditions had documented triggers such as separation from home, idleness, low esprit de corps, exposure to harsh environmental conditions and life-threatening situations. Unfortunately, up to 1918, a legitimate medical explanation for hysteria and shell shock continued to elude medical science: the prevailing medical viewpoint was that mental illnesses such as hysteria and shell shock were the result of a disease of the brain. Still, in spite of this flawed explanation, this period in history provides some important lessons for military leaders looking to mitigate OSIs. First, military operations introduce a wide range of conditions that can elicit stress reactions in participants. Second, regardless of the individual, when exposed to either significant or traumatic stressors everyone has a breaking point. Third, extricating participants from exposure to stressors can have an immediate and positive effect. Finally, individuals suffering from OSIs are best treated in accordance with the military psychiatric principles of proximity, immediacy and expectancy.

During the interwar period between 1918 and 1939, countries like Great Britain struggled to care for and compensate the overwhelming numbers of shell shock victims. According to Bourke, the British Army handled 80,000 cases of shell shock during World War I – a number representing for one-seventh of all personnel discharged for disabilities.⁸⁵ As late as 1939, the British government was paying pensions to 40,000 veterans for mental disorders with an additional 80,000 files awaiting settlement.⁸⁶ Unfortunately, while countries struggled with issues like the post-war mental health crisis and benefits for veterans, many of the practices developed during World War I to deal with shell shock were lost. As Richard Gabriel remarks in his comparative perspective *Military Psychiatry* “the principle of “proximity,” ... was a practical lesson that seems to have been forgotten during the interwar period and did not emerge in practice again until the later days of World War II.”⁸⁷

⁸³ According to Binneveld, the principle of proximity originated during the Russo-Japanese war of 1905. However, the lessons learned by the Russians were forgotten by the onset of World War I and had to be re-learned by the Allies. Binneveld, *From Shell Shock to Combat Stress...*, 138-141.

⁸⁴ These are the accepted definitions of *proximity*, *immediacy* and *expectancy*. The term *positive expectancy* is sometimes used in favour of *expectancy*. Richard A. Bryant, Anke Ehlers, and Richard J. McNally, “Early Psychological Intervention,” *Psychological Science in the Public Interest* 4, no. 2, (November 2003) [journal on-line]; available from [http://www.google.ca/search?q=cache:GA_Qa6xwbXAJ:www.psychologicalscience.org;Internet;accessed 15 March 2004](http://www.google.ca/search?q=cache:GA_Qa6xwbXAJ:www.psychologicalscience.org;Internet;accessed+15+March+2004).

⁸⁵ *BBCi History*, “Shell Shock during World War One...”

⁸⁶ Shephard, *A War of Nerves...*, 165.

⁸⁷ Richard A. Gabriel, “Soviet Military Psychiatry,” in *Military Psychiatry: A Comparative Perspective*, ed. Richard A. Gabriel (New York: Greenwood Press, 1986), 68.

According to English, the allies' failure to recall the lessons learned from World War I led to a relapse in military psychiatry at the outset of World War II. For most of the war, the allies resorted to evacuating shell shock victims to hospitals far away from the front lines. Statistics from the American campaigns in North Africa and Sicily indicate that this approach had a significant and detrimental impact on the percentage of shell shock patients that eventually returned to operations. English contends it was not until the manpower crisis of 1944-45 - when twenty-five percent of all allied casualties were attributed to shell shock - that the allies were finally forced to return to the principles of military psychiatry that proved so successful during World War I.⁸⁸

While the allies had to reacquaint themselves with the lessons of the First World War, the situation was much different in Germany at the outset of war. German military psychiatrists were acutely aware of the problem of shell shock or what the German's called *Kriegsneurosen* (war neuroses). In conjunction with the German *Wehrmacht*, military psychiatrists established a system to care for war neuroses before the war began. The system involved the use of forward facilities to treat neuroses casualties and a personnel replacement program that encouraged the rotation of military units as a whole rather than by replacing soldiers either individually or in small groups.⁸⁹

Interestingly, during the first four years of the war, occurrences of shell shock in the German Army were astonishingly low. Binnevelde attributes this low case rate to Germany's success in the war, the strong esprit de corps amongst German troops, and the confidence the soldiers had in their equipment. He also credits that the German personnel replacement system as having been highly effective:

... units that had suffered heavy losses were collectively withdrawn from the front line. During the subsequent rest period, the new replacements had enough time to prepare themselves for their new destinations and to become integrated... As a result of this, the German units acquired an enormous resilience and they proved to be extraordinarily capable of coping with setbacks and deprivations.⁹⁰

Binnevelde's reference to the successful German replacement system highlights a number of concepts that are central to both understanding and mitigating OSIs. The first is the somewhat obvious notion that soldiers can cope with stressful conditions. Coping is defined as "an adaptation or otherwise successful method of dealing with individual or environmental situations that involve psychological or physiologic stress or threat."⁹¹ The second is the suggestion that it is possible to enhance a soldier's ability to cope to new and stressful conditions: this is known as building a resiliency to stress. The German experience in World War II indicated that units with high morale and strong cohesion enhanced the resiliency of soldiers within those units which led to a greater ability to cope with the stressors they encountered in the first four years of the war.

⁸⁸ English states "35 percent of nonfatal casualties were diagnosed as 'psychiatric'; however, because most of them were evacuated 90 miles or more from the front lines for treatment, no more than three percent were ever returned to combat." English, "Leadership and Operational Stress...", 35.

⁸⁹ Binnevelde, *From Shell Shock to Combat Stress...*, 91.

⁹⁰ Ibid.

⁹¹ Within this definition, *psychological* refers to the powers and functions of the human soul or consciousness. *Physiological* refers to the functioning or state of the body. *University of Newcastle upon Tyne On-line Medical Dictionary*, s.v. "coping," [reference works on-line]; available from <http://cancerweb.ncl.ac.uk/cgi-bin/omd?query=coping&action=Search+OMD>; Internet; accessed 11 March 2004; see also *University of Newcastle upon Tyne On-line Medical Dictionary*, s.v. "psychological," [reference works on-line]; available from <http://cancerweb.ncl.ac.uk/cgi-bin/omd?psychology>; Internet; accessed 11 March 2004; and *University of Newcastle upon Tyne On-line Medical Dictionary*, s.v. "physiological," [reference works on-line]; available from <http://cancerweb.ncl.ac.uk/cgi-bin/omd?physiological>; Internet; accessed 11 March 2004.

While the German experience with shell shock at the outset of the war may be described as favourable, the second half of the war was a much different story. From 1942 onward, the German medical system observed a sharp rise in the number of *Kriegsneurosen* cases. Binneveld attributes this increase to the reversal of German military fortunes in Russia and Europe, the corresponding drop in German morale and the near collapse of the aforementioned personnel replacement program. Also noteworthy was the significant number of neuroses cases involving German soldiers assigned to either extermination parties or concentration camps. Exposure to environments where human atrocities were commonplace imposed unbearable conditions on soldiers that led many to alcohol abuse, insanity, and suicide.⁹²

Notwithstanding the difficulties experienced by both the allies and the Germans, World War II marked some notable steps forward in the area of OSIs. Medical communities – particularly those of Britain and Canada – abandoned the expression shell shock in favour of new medical terms. According to Copp and McAndrew, the official preference was for the medical term NYD (N): Not Yet Diagnosed (Nervous). In practice however, this amazingly impersonal label (one can almost see the “tag” dangling off the patient’s big toe) was supplanted by the concept of battle exhaustion.⁹³

According to Binneveld, both doctors and soldiers endorsed the term “exhaustion” because it reflected “the face of the war... [and] indicated one of the causes for the breakdown of soldiers: overtiredness as the result of lack of sleep and great physical exertion.”⁹⁴ Adding “battle” to the expression implied that the condition was brought on by prolonged exposure to combat. This supported the prevailing opinion amongst the medical and military communities that every soldier, regardless of perceived fortitude, had a breaking point. According to English, the United States Army’s experience during World War II was that after 35 days of sustained combat, 98 percent of soldiers either approached or reached this breaking point.⁹⁵ This sentiment is nicely captured in Lord Moran’s *The Anatomy of Courage*:

Courage is will-power, whereof no man has an unlimited stock; and when in war it is used up, he is finished. A man’s courage is his capital and he is always spending. The call on the bank may be only the drain of the front or it may be a sudden draft which threatens to close the account.⁹⁶

Between World War II and the Vietnam War, advances in the science of biochemistry permitted the observation and measurement of chemical reactions in the human body. Of particular interest to scientists was the most primal of human reactions: fight or flight. Early models of stress - such as Dr. Walter Cannon’s Emergency Theory (1932) and Hans Selye’s Three Stage Model of Stress (1936) – had linked the fight or

⁹² Binneveld, *From Shell Shock to Combat Stress*..., 92.

⁹³ Terry Coop and Bill McAndrew, *Battle Exhaustion: Soldiers and Psychiatrists in the Canadian Army, 1939-1945* (Montreal: McGill-Queen’s University Press, 1990), 22.

⁹⁴ Binneveld, *From Shell Shock to Combat Stress*..., 95.

⁹⁵ English, “Historical and Contemporary Interpretations...”, 5.

⁹⁶ Lord Moran, *Anatomy of Courage* (London: Constable & Company Ltd., 1945), xvi.

flight response to chemical reactions in both humans and animals.⁹⁷ By the 1960's, biochemists were confirming these early theories by measuring the various chemical changes triggered by human reactions to stress. At the onset of the Vietnam War, the connection between stress theory and the symptoms of battle exhaustion had finally been made and, as a consequence, the term battle exhaustion was supplanted by CSR.⁹⁸

During the Vietnam War, American forces suffered rates of CSR comparable to those of battle exhaustion during World War II. However, following the war, an unprecedented number of delayed onset conditions – what are now called PTSD – appeared in the United States. Shabtai Noy suggests this legacy of posttraumatic stress may be partially explained by the rapid release system in place during the Vietnam War. Unlike World War II soldiers who underwent a slow process of discharge from military service, Vietnam veterans had little time to decompress within the confines of the military environment before they were released and left to deal with the trauma of war on their own devices.⁹⁹ In addition to the issue of decompression, English attributes the high rate of PTSD in Vietnam veterans

... to the highly personal nature of the violence, the uncertainty and ambiguity as to who [was or wasn't] a combatant, the necessity of limiting aggressive action, and feelings of guilt over the inability to intervene effectively.¹⁰⁰

The legacy of the Vietnam War illustrates that stress reactions can be precipitated by much more than violence. The conditions and limitations resulting from imposed policies, uncertainty in a mission and a soldier's perceptions of the war can all affect the level of stress experienced during a mission. As a consequence, these factors can impact the number of OSIs during and long after the mission.

From shell shock to CSR, the last fifty years of the industrial era transformed man's understanding of OSIs. While many of the lessons of the First World War were forgotten, proximity, immediacy and expectancy re-emerged as the fundamental principles of military psychiatry in the final years of World War II. Notwithstanding this unfortunate setback, a number of important lessons can be drawn from this period for military leaders looking to mitigate OSIs. First, it is important to realize that a soldier's ability to cope with stress can be influenced - both positively and negatively - by factors such as unit cohesion, esprit de corps and belief in mission, confidence in equipment and leadership. In other words, leadership can play an important role in building resiliency to stress. Second, organizational approaches to such policies as personnel rotations and the integration of replacements into military groups can directly effect cohesion and morale and hence, resiliency amongst soldiers. Third, every soldier, when subjected to sustained military operations will succumb to operational stress. Fourth, the witnessing of an atrocity may equate to a traumatic stressor that

⁹⁷ Walter Cannon studied the effects of stress on the digestive systems of dogs and developed the Emergency Theory – also referred to as the model for fight or flight – that stated “animal and human organisms respond to emergency situations by increased sympathetic nervous system activity.” This adaptive response prepared organisms to cope with dangerous situations. Hans Selye studied the effects of stress on rats and developed a model of stress for organisms. Selye's model consisted of three stages: alarm, resistance and exhaustion. Rebecca Knibb, *Health Psychology: Stress and Coping*, presented by author at the University of Derby Institute of Behavioural Sciences, Derby, [presentation on-line]; available from <http://www.google.com/u/ibs?domains=ibs.derby.ac.uk&q=cannon&sa=Go&site=search=ibs.derby.ac.uk>; Internet; accessed 16 March 2004; see also Paula Martin-Ford, “Stress,” in *Gale Encyclopedia of Alternative Medicine* [reference works on-line]; available from <http://www.findarticles.com/g2603/0006/2603000686/p1/article.jhtml>; Internet; accessed 16 March 2004.

⁹⁸ Binneveld, *From Shell Shock to Combat Stress...*, 97.

⁹⁹ Shabtai Noy, “Combat Stress Reactions,” in *Handbook of Military Psychology*, ed. Reuven Gal and A. David Mangelsdorff (Chichester: John Wiley & Sons Ltd., 1991), 509.

¹⁰⁰ English, “Historical and Contemporary Interpretations...”, 6.

can produce acute and posttraumatic stress injuries.¹⁰¹ Finally, an OSI is a biochemical reaction to stress that can manifest during and long after military operations.

The post-Vietnam period began what is described in *War and Antiwar* as the third wave of human history: the information era. This era introduced a new set of challenges for military psychiatry. According to Toffler and Toffler, with the onset of “third wave war”, the “front line” that was common to conflicts during the industrial era vanished with concepts such as rapid manoeuvre and air-land warfare.¹⁰² Operation Desert Storm illustrates this concept. The war began with a 38-day air campaign that recognized no front and concluded with a 72-hour land campaign that ended before a front could truly be identified.¹⁰³ The implications of “the vanishing front” on military psychiatry are significant. As Dr. Robert Ursano, Chairman of the Psychiatry Department at the Uniformed Services University of the Health Sciences points out, during the most recent Gulf War, American military operations moved so quickly that it was difficult to treat patients in close proximity to the front and equally challenging to return patients to their units upon recovery.¹⁰⁴ In essence, today’s manoeuvre warfare establishes a rapidly changing environment in which a system of care based on the principles of proximity, immediacy and expectancy can be compromised. Notwithstanding, Ursano contends that these principles are enduring necessities in military operations, and as such, these challenges must be overcome through persistence.

The second challenge for military psychiatry in the information era has been the changing face of military operations. Increasingly since the end of the Cold War, modern militaries have been involved in OOTW including the domestic, peacekeeping, humanitarian and peace enforcement operations covered in Chapter 2. As an example, between 1990 and 2004, the Canadian military participated in 32 major domestic and international operations. Of this total, only one mission – the 1991 Gulf War – can be categorized as traditional war fighting.¹⁰⁵

While the face of military operations may have changed since the Cold War, Volker C. Franke contends that the military personnel conducting these operations were not adequately prepared for these new types of missions. Franke identifies a disconnect between the *social identity* of the aggressive warrior and the mission requirements of OOTW. Soldiers trained for a traditional war-fighting environment were now charged with fulfilling humanitarian assistance, peacekeeping, and peace enforcement missions for which they have received limited socialization, training and exposure. This disconnect was exacerbated by missions, military objectives and rules of engagement that often contradicted their beliefs and practices as warriors.¹⁰⁶ In short,

¹⁰¹ Not everyone will react to a *traumatic event* in the same manner and not everyone who witnesses an atrocity will develop either ASD or PTSD. The DSM IV definition of a *traumatic event* (see page 8) focuses on the human perception and reaction to the event and not the event itself.

¹⁰² Toffler and Toffler, *War and Anti-war...*, 64.

¹⁰³ *USA Today World*, “1991 Gulf War chronology,” [reference works on-line]; available from <http://www.usatoday.com/news/index/iraq/nirq050.htm>; Internet; accessed 16 March 2004.

¹⁰⁴ Erik Baard, “Military Psychiatry Revamps Old Tune: ‘Nervous From the Service’,” in *The Village Voice* [reference works on-line]; available from <http://www.villagevoice.com/issues/0315/baard.php>; Internet; accessed 16 March 2004.

¹⁰⁵ *Mapleleafweb*, “Canada and peacekeeping: A history of Canada’s participation,” [reference works on-line]; available from http://www.mapleleafweb.com/features/military/peace_keeping/history.html; Internet; accessed 16 March 2004; see also Department of National Defence, *Operations: Past Operations*, (Ottawa: Assistant Deputy Minister (Public Affairs), 2004) [public document on-line]; available from http://www.forces.gc.ca/site/operations/past_ops_e.asp; Internet; accessed 19 March 2004.

¹⁰⁶ The terms *social identity* and *identity* shall be used synonymously throughout this paper. Volker C. Franke, “The Social Identity of Peacekeeping,” in *The Psychology of the Peacekeeper – Lessons from the Field*, ed. Thomas W. Britt and Amy B. Adler (Westport: Praeger Press, 2003), 32-33.

the *identity* demands associated with OOTW frequently conflicted with the *social identity* of those soldiers conducting the mission.

According to Franke, one of the adverse consequences of this disconnect was that many soldiers experienced what is called *cognitive dissonance* or a conflict between incompatible beliefs or actions.¹⁰⁷ *Cognitive dissonance* produces psychological stress that drives an individual to resolve this incompatibility - typically by changing one or both of the beliefs or actions.¹⁰⁸ Unfortunately, during OOTW some soldiers have had difficulty questioning their war fighting *identity*. The result has been cases of unacceptable behaviour, misconduct and excessive use of force. “At the extreme, this cognitive dissonance may [have] lead to such calamitous behaviours as the torture and murder of a Somali youth by members of the elite Canadian Airborne Regiment.”¹⁰⁹ Those individual’s who could not resolve this dissonant condition often felt out of place in OOTW, unable to take action or make a positive contribution to mission. For some, the psychological stress experienced during *cognitive dissonance* persisted and went on to produce OSIs.¹¹⁰

From the outset, the types of stress related injuries experienced in military OOTW appeared consistent with those seen in traditional war fighting. As English points out, the Board of Inquiry for Operation HARMONY – Canadian Peacekeeping Operations in Croatia – documented cases of unexplained physical symptoms, mental illness and delayed onset symptoms consistent with past wars.¹¹¹ Moreover, a Walter Reed Army Institute of Research study conducted on a battalion of American peacekeepers found “that the lack of action and the defensive posture of the peacekeeping mission was potentially more stressful than active operations for elite troops.”¹¹² Clearly, even in the absence of violent conflict, military OOTW demonstrated the potential to elicit OSIs.

Whether or not this outcome was predictable, it seems obvious that nations such as Canada were inadequately prepared to handle stress victims in OOTW. Between 1993-94, Lieutenant-General Romeo Dallaire and the members of the UNAMIR served amidst the atrocities of war-torn Rwanda in the absence of any formalized system of psychiatric care. For many like Dallaire, treatment for stress disorders began not in theatre but upon return to Canada.¹¹³ Boddam contends this system of treatment was, to a large degree, the result of resource restrictions placed on many Canadian Forces operations during this timeframe. Given the mission manning limitations, there was no conceivable way in which preventive treatment facilities could be established. Consequently, Canadian international operations relied upon either the medical services of our allies or distant care facilities back in Canada to treat OSIs.¹¹⁴ English partially attributes the high number of OSIs reported to the Croatia Board of Inquiry between 1993-95 to the regression of what was essentially “a pre-1918 model of dealing with operational stress... emphasiz[ing] treatment over proven methods of prevention.”¹¹⁵ In short,

¹⁰⁷ Ibid., 32.

¹⁰⁸ Ithaca College, “Cognitive Dissonance,” [reference works on-line]; available from <http://www.ithaca.edu/faculty/stephens/cdback.html>; Internet; accessed 28 April 2004.

¹⁰⁹ Franke, “The Social Identity...”, 32.

¹¹⁰ Ibid., 32-34.

¹¹¹ English, “Leadership and Operational Stress...”, 34.

¹¹² English, “Historical and Contemporary Interpretations...”, 7.

¹¹³ Carol Off, *The Lion, The Fox and the Eagle: A Story of Generals and Justice in Yugoslavia and Rwanda* (Toronto: Random House Canada Ltd., 2000), 100.

¹¹⁴ Colonel Randy Boddam, telephone conversation with author, 27 April 2004.

¹¹⁵ English, “Leadership and Operational Stress...”, 34.

the Canadian approach to operational stress up to the mid-1990s was limited to a system of responsive care located far from the area of operations. Moreover, the responsibility for implementing these systems was left almost exclusively to the medical community.

Most recently, the overall knowledge of OSIs has dramatically improved in Canada. Captain (N) Richard Town attributes this change to the interest generated by the aforementioned Croatia Board of Inquiry, the video documentary *Witness to Evil* and Defence Ethics initiatives.¹¹⁶ In addition, the efforts of the Canadian Forces Ombudsman in this area cannot be ignored. *The Special Report to the Minister of National Defence on the Systemic Treatment of CF Members with PTSD* highlighted a number of inherent flaws in the Canadian Forces system of care including general education and training of military personnel, deployment procedures, and the education afforded care givers. This shift in knowledge and attitude in Canada has inspired a number of recent changes. First and foremost, there has been a re-emergence of the principles of proximity, immediacy and expectancy in the system of psychiatric care during Canadian military operations. Second, the responsibility of establishing and implementing this system of care is now largely shared between health care providers and military leaders. And finally, the system of psychiatric care established for any military operation now includes both responsive and preventive measures that bridge the entire deployment process.¹¹⁷

Philosopher George Santayana once wrote of history: "Progress, far from consisting in change, depends on retentiveness. Those who cannot remember the past are condemned to repeat it."¹¹⁸ The history of operational stress – replete with lessons learned, forgotten and relearned - exemplifies Santayana's contention. Nonetheless, from the first tribal cultures to today's information based societies, mankind's knowledge of operational stress has evolved from merely recognizing symptoms and attributing them to a disease to understanding the complex biochemical reactions that cause stress disorders and taking action to prevent them. Given man's penchant to disregard the lessons of the past, it is worthwhile to take a moment to summarize some of the enduring themes of military psychiatry that can be drawn from history:

- OSIs are biochemical reactions to stress.
- OSIs include a broad range of stress related disorders including ASD, PTSD and CSR.
- OSIs can result from military operations across the complete spectrum of conflict and are not restricted to combat operations.
- everyone has a breaking point: when subjected to sustained military operations, soldiers will succumb to operational stress.
- individuals suffering from OSIs are best treated in accordance with the military psychiatric principles of proximity, immediacy and expectancy.
- a soldier's ability to cope with stress can be influenced both positively and negatively by military leadership.
- the responsibility of establishing and implementing a system of care is best shared between health care providers and military leaders.

¹¹⁶ R.R. Town, "The Effect on Sustainment of Stress in Operations," (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 1999), 17-18.

¹¹⁷ Department of National Defence, *Special Report: Systemic Treatment of CF Members with PTSD* (Ottawa: Ombudsman, 2001), 89-139.

¹¹⁸ *Wikiquote*, "George Santayana (1863-1952)," [reference works on-line]; available from [http://quote.wikipedia.org/wiki/George_Santayana#The_Life_of_Reason_\(1905\)](http://quote.wikipedia.org/wiki/George_Santayana#The_Life_of_Reason_(1905)); Internet; accessed 18 March 2004.

- the system of psychiatric care established for any military operation now includes both preventive and responsive measures that bridge the entire deployment process.

4.0 THE SCIENCE BEHIND THE PARADOX

Having reviewed the lexicon and history of stress, the concept that OSIs stem from biochemical reactions to stress should be abundantly clear. Having said this, an understanding of how the human body responds under stress is necessary to highlight the paradox of fight or flight and to further reinforce the assertion that everyone can succumb to stress.

As previously mentioned, stress responses can be categorized as either acute or chronic. Both involve arousal of an area of the brain called the limbic system and the human sympathetic nervous system.¹¹⁹ Within the limbic system (illustrated in Figure 4), the hypothalamus is responsible for maintaining what Cannon originally called “homeostasis” or the equilibrium of the body.¹²⁰ Dr. George Boeree describes the hypothalamus’ role in homeostasis as the process of keeping the body in balance and returning it to its set point. “The hypothalamus is responsible for regulating ... hunger, thirst, response to pain, levels of pleasure, sexual satisfaction, anger and aggressive behaviour.”¹²¹ During an acute response to a stressor, the hypothalamus causes the adrenal glands to release adrenal and non-adrenal hormones into the blood stream. These hormones stimulate the physical responses in the body that are necessary to either fight or flee an emergency situation. These physical manifestations include increased heart rate and blood pressure, dilation of blood vessels in large muscles and constriction of blood vessels in the rest of the body, expansion of the bronchial tubes in the lungs, increased sugar levels and pupil dilation. Once the stressor is removed, these hormones dissipate and the hypothalamus re-establishes equilibrium in the body: this explains the transient nature of acute stress response.¹²²

¹¹⁹ The sympathetic nervous system is a network that connects our senses, skin, blood vessels and internal organs. John W. Kimball, “Organization of the Nervous System,” in *Kimball’s Biology Pages* [reference works on-line]; available from <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/P/PNS.html>; Internet; accessed 17 March 2004.

¹²⁰ Martin-Ford, “Stress...”

¹²¹ C. George Boeree, “The Emotional Nervous System,” in *General Psychology* [reference works on-line]; available from <http://www.ship.edu/~cgboeree/limbicsystem.html>; Internet; accessed 17 March 2004.

¹²² Ibid.

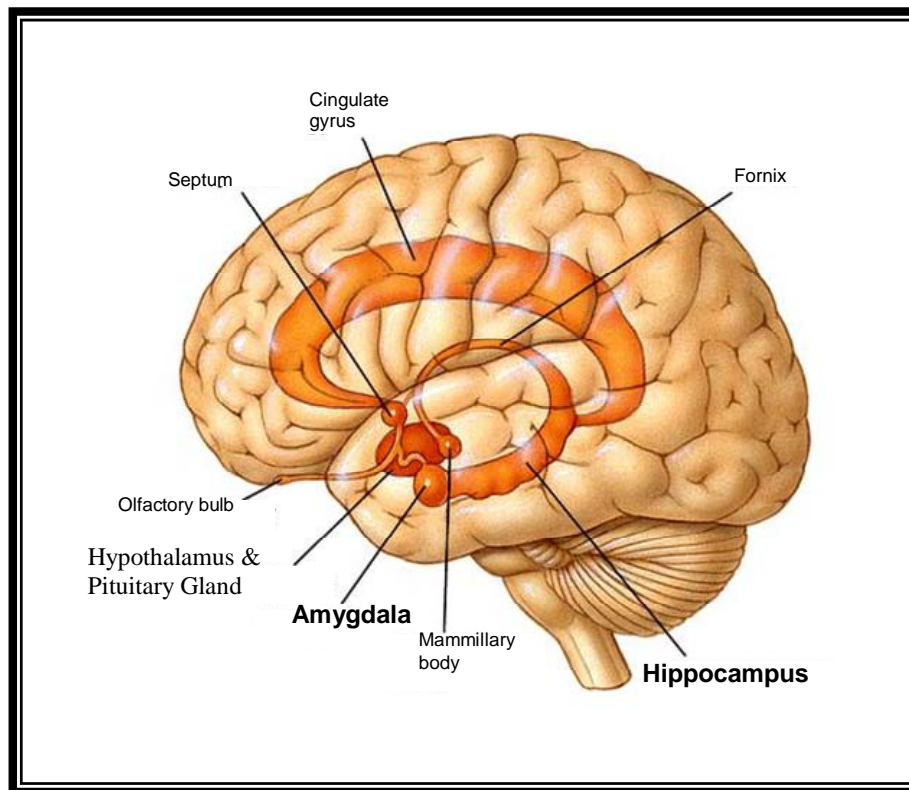


Figure 4: The Limbic System. Major limbic system structures include the *hypothalamus and pituitary gland, amygdala and hippocampus*. Jacob L. Driesen, "The Limbic System – 2," in Jacob L. Driesen, Ph. D. [reference works on-line]; available from http://www.driesen.com/the_limbic_system_-_2.htm; Internet; accessed 21 March 2004.

Exposure to prolonged acute stress – referred to earlier as chronic stress – effects the limbic and sympathetic nervous system in manner consistent with acute stress reaction but over sustained periods. In addition, under chronic conditions the hypothalamus and pituitary gland produce a chemical referred to as the adrenocorticotrophic hormone. Also known as the stress hormone, adrenocorticotrophic triggers the adrenal gland to release a hormone called cortisol that regulates human sleep patterns and is instrumental in memory formation. An overabundance of this hormone – a condition common in chronic stress reaction - can lead to sleep and nervous disorders, skin conditions, immune system deficiencies and a variety of long-term illnesses.¹²³

Traumatic events can produce physical responses consistent with acute and chronic stress. However, traumatic stressors often have an overwhelming effect on the sympathetic nervous system and two primary areas of the limbic system known as the amygdala and hippocampus. The amygdala is the area of the brain responsible for regulating emotional responses such as anxiety, fear and anger.¹²⁴ The hippocampus is

¹²³ NCERx Health Sites, "Stress and Health..."

¹²⁴ Boeree, "The Emotional Nervous System..."

covered with receptors for cortisol. Dr. Bruce McEwen and Elizabeth Lasley describe the hippocampus as “the keeper of the citadel of memory” because it controls both short and long-term recollections.¹²⁵

Traumatic stressors start by hyper-stimulating the hypothalamus and obstructing homeostasis. The resulting rush of hormones released by the hypothalamus and pituitary gland overwhelms the nervous system, amygdala and hippocampus and produces symptoms consistent with CSR, ASD and PTSD presented in Chapter 2 of this paper.¹²⁶ Moreover, McEwen and Lasley contend that the elevated levels of cortisol that typically follow traumatic experiences directly effect the size of the hippocampus and overall memory capacity. For example, studies conducted on Vietnam veterans suffering from PTSD and memory difficulties showed reduced hippocampal volume.¹²⁷

The science behind acute and chronic stress reactions as well as CSR, ASD and PTSD serves to highlight the *paradox of fight or flight*. While this instinctive response is essential to man’s survival, the biochemical reactions brought on by stress can also elicit serious mental and physical health problems including OSIs. It is in understanding the science behind the paradox that military leaders can take the important steps necessary to mitigate these stress related injuries.

5.0 MITIGATING OPERATIONAL STRESS INJURIES

5.1 Practitioners of Preventive Care

Armed with an understanding of the lexicon, history and science of stress, it is now possible to advance the thesis that military leaders can mitigate OSIs through a system of preventive and responsive care. The term *mitigate* is used deliberately in this thesis because it has two important and complementary meanings. First, mitigate can mean making a condition less prevalent. Second, it can denote making the extent of a condition less severe.¹²⁸ Applying these nuances to the thesis of this paper, mitigating OSIs implies that the number of incidents of OSIs can be *lessened* through preventive measures and occurrences of operational stress can be *alleviated* through responsive care.

According to Thompson and Gignac, personnel are exposed to stressors “across the entire employment cycle, beginning during pre-deployment, and continuing through the deployment, and post-deployment phases.”¹²⁹ If the concept of prevention implies taking action to prevent the occurrence of a particular condition, then it stands to reason that mechanisms designed to prevent OSIs can be employed in one or more of these phases.¹³⁰

¹²⁵ Bruce S. McEwen and Elizabeth Norton Lasley, *The End of Stress as We Know It* (Washington, D.C.: The Dana Press, 2002), 108.

¹²⁶ Boeree, “The Emotional Nervous System...”

¹²⁷ McEwen and Lasley, *The End of Stress...*, 117.

¹²⁸ *HyperDictionary*, s.v. “mitigate,” [reference works on-line]; available from <http://www.hyperdictionary.com/dictionary/mitigate>; Internet; accessed 18 March 2004.

¹²⁹ The term *employment phase* is used synonymously with *deployment phase*. While *A model of psychological adaptation in Peace Support Operations: An Overview* discusses an adaptation model for peace support operations, discussions with Megan Thompson confirmed that exposure to stressors is common to operations across the entire spectrum of conflict. Megan M. Thompson and Monique A.M. Gignac, “A model of psychological adaptation in Peace Support Operations: An Overview,” (Technical Report, Defence and Civil Institute of Environmental Medicine, 2001), 1; see also Megan M. Thompson, telephone conversation with author, 17 March 2004.

¹³⁰ Prevention is defined as: “control by preventing the occurrence of something.” *HyperDictionary*, s.v. “prevention,” [reference works on-line]; available from <http://www.hyperdictionary.com/dictionary/prevention>; Internet; accessed 18 March 2004.

As it turns out, preventive mechanisms instituted in advance of a deployment – namely the pre-deployment phase - can serve to lessen the number of OSIs incurred during and after a deployment. The first of these mechanisms is personnel screening and selection, the purpose of which is to determine if personnel are suitable for deployment.¹³¹ While the process typically includes the examination of a candidate's medical, personal and psychological background, the 1997 Somalia Inquiry made it clear that a review of disciplinary and behavioural histories is also necessary.¹³² As a consequence, the screening process is a collaborative effort between the medical, psychological and military communities.¹³³

The contribution that proper screening can make in mitigating OSIs merits explanation. In addition to identifying physical impediments to deployment, screening may help ascertain if a soldier is suffering from acute and chronic stress reactions as well as more serious stress disorders. This psychological assessment is key because, as the Ombudsman points out “[s]oldiers suffering from stress-related problems have actually been known to volunteer for a deployment, hoping that it will help them “feel better.””¹³⁴ Of course, given the previously explained medical science of stress this type of logic is clearly flawed. Deploying soldiers with existing stress conditions into an environment with new and potentially significant stressors may exacerbate their condition. It stands to reason that these candidates have a greater susceptibility to OSIs and, as a consequence, screening such candidates from deployable status ultimately serves to prevent OSIs.¹³⁵

There is an important role to be played by military leaders in the screening and selection process. Leaders at the tactical level - junior leaders, senior leaders, junior officers and senior officers - contribute to the process by making informed recommendations on the suitability of their subordinates to their Commanding Officer. Of course, medical personnel will also make their recommendations, but ultimately the final decision on deployment suitability rests squarely with the Commanding Officer of the unit or formation.¹³⁶ This final decision should reflect whether an individual is truly suitable for deployment. However, as Thompson and Pastò point out, many military leaders do not insist on thoroughness because they “consider the screening process to be perfunctory, especially if there is limited time between mission notice and date.”¹³⁷ To this point in the essay, the pitfalls of such an approach should be self-evident. Commanding Officers are best to insist on a thorough screening process and heed the advice of subordinate leaders in their chain of command and the recommendations of medical personnel to ensure that soldiers identified as susceptible to operational stress do

¹³¹ Department of National Defence, *Special Report...*, 124.

¹³² “At the time CF officers were planning for the deployment to Somalia, avoidance of costly and disruptive repatriation and replacement of personnel from an operational theatre was the focus of pre-deployment screening of soldiers. In accordance with Canadian Forces Administrative Orders in effect at the time, emphasis was placed on administrative, medical, and family problems, as opposed to matters involving disciplinary concerns or other suitability factors.” Commission of Inquiry into the Deployment of Canadian Forces to Somalia, *Dishonoured Legacy...*, 246.

¹³³ Depending on location, medical and psychological screening may be performed by either military or civilian personnel.

¹³⁴ Department of National Defence, *Special Report...*, 124.

¹³⁵ Screening individuals susceptible to OSIs is a difficult task. In all practicality, screening may only identify those individuals with obvious deployment issues. An argument can be made that leaders who *know their men* will identify such individuals prior to screening. Notwithstanding this argument, if screening is formalized, it should identify obvious cases regardless of the quality of leadership and the knowledge that leaders have of their men.

¹³⁶ Department of National Defence, *Queen's Regulations and Orders for the Canadian Forces, Volume 1-Administration, Chapter 4-Duties and Responsibilities of Officers, Section 5-Responsibilities of a Commanding Officer, Article 4.20* (Ottawa: Assistance Deputy Minister Finance and Corporate Services, 2003) [public document on-line]; available from http://www.forces.gc.ca/admfincs/subjects/qro/vol1/ch003_e.asp#3.01; Internet; accessed 18 March 2004.

¹³⁷ Thompson and Pastò, “Psychological Interventions...”, 227.

not deploy. Ultimately, if the screening and selection process is properly executed prior to a deployment, it can be an effective system of prevention that allows a Commanding Officer to mitigate OSIs.

While screening and selection may *weed-out* candidates susceptible to stress injuries prior to deployment, the process does little to mitigate the potential for OSIs in the majority of personnel that are screened as suitable. For those selected to deploy, military leaders must look to other methods to mitigate OSIs.

Arguably one of the most effective methods that can be employed during the pre-deployment and employment stages is referred to as building individual resiliency. Referred to earlier in this paper, resiliency is defined as a higher capacity to recover and adapt to a new situation. A soldier's natural or uninfluenced resiliency is described as *baseline resiliency*.¹³⁸ Building resiliency prior to deployment and re-enforcing resiliency during operations allows a soldier to cope in the face of stressful events. According to Fredrick Manning of the Walter Reed Army Institute of Research the keys to building resiliency in individuals are unit cohesion and the protective power of high morale.¹³⁹

Edward Meyer described unit cohesion as “the bonding together of soldiers in such a way as to sustain their will and commitment to each other, the unit, and mission accomplishment, despite combat or mission stress.”¹⁴⁰ According to a number of studies, the perception of a close group bond can increase a soldier's resiliency to stressful events. For example, a study conducted on firefighters by Cheryl Regehr, David Hemsworth and John Hill determined that an individual's ability to cope with traumatic stressors was greatly influenced by their perception of the supportive relationship that existed within their work environment and amongst their co-workers. Individuals who perceived they had less cohesion with their co-workers and less support on the job tended to have greater instances of depression and PTSD following a traumatic event.¹⁴¹ Similar stress injury studies conducted following World War II and conflicts involving the Israeli Defence Force “found it was differences in unit cohesion rather than combat intensity which most clearly differentiated stress casualties.”¹⁴² For example, Brendan McBreen attributes the high number of American psychiatric casualties experienced in Europe during World War II to poor unit cohesion:

¹³⁸ *Baseline resiliency* is not an official medical term to the best knowledge of the author. The term was created for this paper to describe an individual's *baseline* or inherited level of resiliency prior to the application of resiliency building methods. *Baseline resiliency* may be affected either positively or negatively.

¹³⁹ The terms *principles*, *methods*, *means*, and *strategies* are used synonymously in this paper to describe the ways in which unit cohesion and morale are developed. Frederick J. Manning, “Morale, Cohesion and Esprit de Corps,” in *Handbook of Military Psychology*, ed. Reuven Gal and A. David Mangelsdorff (Chichester: John Wiley & Sons Ltd., 1991), 454-456.

¹⁴⁰ *Ibid.*, 457.

¹⁴¹ While not a military study, the Regehr, Hemsworth and Hill article examined individuals exposed to traumatic environmental stressors that resulted in acute and posttraumatic stress disorders. As a result, it is considered relevant to this essay. Cheryl Regehr, David Hemsworth and John Hill, “Individual Predictors of Posttraumatic Distress: A Structural Equation Model,” *The Canadian Journal of Psychiatry* 46, (2001) [journal on-line]; available from <http://www.cpa-apc.org/Publications/Archives/CJP/2001/Mar/Individual.asp>; Internet; accessed 15 October 2003.

¹⁴² Manning, “Morale, Cohesion and Esprit de Corps...”, 466.

U.S. Army doctors recognized that soldiers who complained of “loneliness and helplessness” would rapidly become stress casualties... The lack of attention that the U.S. Army ... paid to unit cohesion was directly reflected in the casualty statistics. In 1943, U.S. Army divisions in Europe averaged twenty-six percent a year, ten times that of the German army.¹⁴³

McBreen’s remarks corroborate the contention advanced by Binneveld earlier in this paper that cohesion within units of the Germany *Wehrmacht* greatly enhanced resiliency amongst unit members.

Given this well-established connection with resiliency, it seems clear that military leaders cannot leave unit cohesion to happenstance and the hardships of military operations. A clear strategy to advance unit cohesion must be implemented well in advance of deployment. As simple as it may sound, one of the most effective strategies for promoting unit cohesion involves the sharing of common experiences. On this concept Manning writes:

The more time people are together, the greater the chance they will discover, invent and experience commonalities ... This is a natural phenomenon of groups, and increases with the number of roles and settings in which members know each other and feel comfortable interacting.¹⁴⁴

Common experiences shared through formal training and exercises and social and sporting events provide a soldier with “confidence in the ability and determination of their peers and leaders to protect them in combat... that he or she is firmly embedded in ‘network of mutual obligation.’”¹⁴⁵ In short, shared experiences breed confidence, which in turn promotes the bond or interdependence between peers, and leaders that is the essence for unit cohesion.

Typically, unit training and participation in exercises falls upon a Commanding Officer and the leadership under his command to plan and execute. And, while extracurricular activities are not technically the responsibility of a unit’s leadership, an influential role should be played here as well. Given that unit cohesion is strongly influenced through shared experiences, it stands to reason that military leaders should focus considerable energy to ensure that those under their command are brought together to train, exercise and socialise. In doing so, military leaders build resiliency in their personnel that can ultimately mitigate stress injuries during operations.

Another key method of building unit cohesion is by clearly defining the mission and its relevance. This method can be applied throughout the employment cycle. According to Colonel Scott Becker, it is the intrinsic value of a mission that bonds members of a unit together and inspires them to do things that would not normally be in their best interests.¹⁴⁶ By defining the mission and its relevance, “good leaders can

¹⁴³ Brendan B. McBreen, “Improving Unit Cohesion: The First Step in Improving Marine Corps Infantry Battalion Capabilities,” (Dissertation, Marine Corps Fellowship Program, 2002) [unpublished material on-line]; available from <http://www.2ndbn5thmar.com/coh/iuc.htm>; Internet; accessed 20 March 2004.

¹⁴⁴ Manning, “Morale, Cohesion and Esprit de Corps...”, 462.

¹⁴⁵ Ibid., 463.

¹⁴⁶ Colonel Becker is a Dental Officer currently serving as Director Canadian Forces Dental Services. During Operation PERSISTENCE, then Lieutenant-Colonel Becker was Commanding Officer of 1 Dental Unit and was the Commander of the dental forensic team. Becker and the fifty-four members of the dental forensic team were charged with identifying the victims of Swiss Air Flight 111 using dental records. Forensic activities lasted eight weeks, and during this period, Becker’s team sorted through approximately 15,000 body parts and pieces to identify 102 of the 229 accident victims. Colonel Scott A. Becker, interview with author, 17 March 2004.

demonstrate to their units that they care – by seeing that their efforts and the risks (and losses) they incur are for something undeniably worthwhile.”¹⁴⁷ Strong cohesion existed amongst the fifty-four members of the Canadian Forces dental forensic team during Operation PERSISTENCE because, as Becker points out, the team fully understood the mission and its value to the surviving families.¹⁴⁸ Similarly, Manning attributes the collapse of discipline and cohesion that occurred during Vietnam to relevancy of overall mission:

Certainly the discipline problems, wholesale drug abuse, and fraggings of the US Army in Vietnam came primarily in the latter years of the war, when it was clear to all that America had made the judgment that their task was not worth pursuing. Interpersonal bonding at the small unit level could not overcome the quite rational desire not to be the last one killed in an effort without glory or thanks.¹⁴⁹

While this may be an extreme example, it serves to illustrate the importance of reinforcing the value of the mission throughout a deployment. Even when public opinion for a mission is favourable, sustained environmental and traumatic stressors can effect a soldier in such a way that he begins to question the value of the mission in relation to the sacrifices he is making. Becker suggests the best solution to this problem is continuous “group validation” throughout the mission. Group validation involves making a direct connection between unit accomplishments and the overall objectives of the mission. For example, during Operation PERSISTENCE, one of the methods used to build and sustain cohesion within the dental forensic team was through daily reminders of how their efforts helped grieving families achieve closure and receive death benefits.¹⁵⁰

Historic examples confirm as fact what common sense would suggest: that individuals will rally around a mission with purpose and while doing so, form close bonds with their peers and leaders. The implications of this fact for leaders cannot be overstated. At the outset of an operation, military leaders at all levels must communicate a mission and its objectives in such a manner that they are clear and meaningful to subordinates. In addition, military leaders must re-enforce the value of the mission through persistent validation of their subordinates’ efforts. Following these important principles, military leaders will build unit cohesion, foster resiliency in individual soldiers and ultimately mitigate OSIs.

The second key to building individual resiliency is the protective power of high morale. Stasiu Labuc of the British Army Personnel Research Establishment describes morale as a mental quality that instinctively drives a soldier forward against his own desires.¹⁵¹ John Baynes refers to morale as

... the most important quality of a soldier. It is a quality of mind and spirit which combines courage, self-discipline, and endurance... a confident, resolute, willing, often self-sacrificing and courageous attitude of an individual to the functions or tasks demanded or expected of him by a group of which he is part that is based upon such factors as pride in the achievements and aims of the group, faith in its leadership and ultimate success, a sense of fruitful participation in its work, and a devotion and loyalty to the other members of the group.¹⁵²

¹⁴⁷ Manning, “Morale, Cohesion and Esprit de Corps...”, 464.

¹⁴⁸ Becker, interview with author...

¹⁴⁹ Manning, “Morale, Cohesion and Esprit de Corps...”, 464-465.

¹⁵⁰ Becker, interview with author...

¹⁵¹ Stasiu Labuc, “Cultural and Societal Factors in Military Organizations,” in *Handbook of Military Psychology*, ed. Reuven Gal and A. David Mangelsdorff (Chichester: John Wiley & Sons Ltd., 1991), 472.

¹⁵² John Baynes, *Morale: A Study of Men and Courage* (London: Cassell & Company Ltd., 1967), 108.

Data regarding the impact of high morale suggests that it is as important to building resiliency as unit cohesion. Labuc writes that during the 1967 Israeli Six Day War high morale amongst Israeli soldiers corresponded with very low stress casualty rates. In Lebanon 15 years later, the Israeli Defence Force suffered few stress casualties at the outset of the conflict when morale was high. However, during the slow advance into Beirut morale amongst the troops plummeted and it was during this period of the conflict that the vast majority of OSIs were sustained.¹⁵³ Studies conducted on one hundred Army companies prior to and after the allied invasion of Normandy showed a strong predictive relationship between pre-invasion morale and post-invasion OSIs.¹⁵⁴ As was the case with unit cohesion, these historical records reinforce Binneveld's contention that morale within units of the *Wehrmacht* during World War II greatly enhanced resiliency amongst unit members.

In light of the clear relationship between high morale and resiliency, it is incumbent upon military leaders to do their utmost to maximize morale amongst their subordinates. In general, high morale in soldiers can be achieved through the development of unit cohesion and providing for the physical and psychological needs of soldiers.¹⁵⁵ As discussed earlier, unit cohesion can be achieved by applying the principles of shared experiences, mission clarity and meaning and validation.

Above and beyond unit cohesion, dealing with a soldier's physical needs is also fundamental to morale. Access to good food, healthcare, clean uniforms, areas of rest and sleep, ablutions and cleaning facilities and environmental protections all contribute to high morale amongst the troops. Taking control of these "basic essentials" should be a concern for leaders throughout the employment cycle. During the deployment phase for example, many soldiers are divorced from the domestic support mechanisms that traditionally satisfy their physical needs. Manning observes:

A hot meal in the company of comrades can work wonders for morale. In fact, a hot meal in a relatively safe environment has been high on the list of treatments for stress casualties ever since we recognized the psychological nature of shell shock in World War I.¹⁵⁶

While satisfying fundamental physical needs seems like a simple enough concept, history is fraught with examples of poorly sustained missions and correspondingly low morale. Dallaire writes of the lack of basic essentials and its resultant impact on morale during the UNAMIR:

My Kigali staff, still living in terrible conditions, were visibly tiring ... I nearly had a second mutiny over food when another batch of German rations was opened and it smelled to high heaven. These rations, so generously provided to us when we had nothing left to eat, were now well beyond their best-before date.¹⁵⁷

The fact that General Dallaire was the UNAMIR mission commander suggests that sometimes sustainment and the provision of basic essentials is difficult for leaders at any level to control. Nonetheless, his comments clearly illustrate the relationship between meeting physical needs and morale. In the end, history has proven that military leaders that manage to provide for the physical needs of their subordinates can have a direct and

¹⁵³ Stasiu Labuc, "Cultural and Societal Factors...", 484-485.

¹⁵⁴ Manning, "Morale, Cohesion and Esprit de Corps...", 466.

¹⁵⁵ Manning states that unit cohesion is one of several factors that contribute to individual morale. Ibid., 456.

¹⁵⁶ Ibid., 461.

¹⁵⁷ Dallaire, *Shake Hands with the Devil*..., 484.

positive effect on morale. Given the relationship between morale and building individual resiliency, it is reasonable to conclude that in meeting the physical needs of subordinates, military leaders can mitigate OSIs.

As with physical needs, soldiers have a number of important psychological needs that can influence morale. As stated earlier, unit cohesion is strongly influenced by a clear and meaningful mission. Morale, as it turns out, is strongly dependent on an individual's psychological need to play a role and make a valuable contribution to the mission.¹⁵⁸ Charles Moskos studied this dependency in American combat units during the Vietnam War. He found that soldiers view wars in a very private and individualistic manner. In specific, he used the term *latent ideology* to describe what he observed as a soldier's personal motivation toward the importance of the overall mission. He concluded that a soldier will maintain his role in an operation

... only when he has an underlying commitment to the worth of the larger social system for which he is fighting... he must at some level accept, if not the specific purpose of the war, then at least the broader rectitude of the social system of which he is a member.¹⁵⁹

Soldiers must feel that the role they play in the overall mission has purpose and value. In the end, if the soldier has a *goal* and a *role* then he establishes a connection or an *identity* with the mission which goes a long way to satisfying his psychological needs.¹⁶⁰

With this *identity* concept in mind, military leaders can take a number of important steps toward meeting the psychological needs of a soldier. As previously argued, the leader must first clearly explain the mission and its value. Second, the leader must specify the soldier's role and the worthwhile contribution the soldier can make to the mission. While doing so, the leader must be mindful to manage any unrealistic beliefs or expectations the soldier may have regarding the mission. Then, throughout the employment cycle, the leader must play an active role in fostering the soldier's confidence in his ability to meet his goal. According to McBreen, the best means of fostering self-confidence is by building tactical and technical proficiency through challenging and progressively difficult training and operations.¹⁶¹ Labuc supports this idea and argues that arduous and realistic training not only improves a soldier's personal satisfaction and confidence, but it also has a direct impact on his overall resiliency:

... it is evident from the literature on stress that well rehearsed drills are less prone to the negative effects of stress... by keeping the soldier occupied with some purposeful activity in times of stress he is better able to cope with his anxiety.¹⁶²

Having established an identity and self-confidence, the final step in meeting a soldier's psychological needs is what Becker calls "individual validation." The process of individual validation involves recognizing and rewarding individual performance and re-affirming the soldier's *social identity*. As an example, Becker recounts that the forensic team leaders during Operation PERSISTENCE took extra time to connect individual

¹⁵⁸ John J. Zentner, "The Art of Wing Leadership: Exploring the Influences of Aircrew Morale in Combat," (Thesis, Air University School of Advanced Airpower Studies, 2000), 16-17.

¹⁵⁹ Charles C. Moskos, *The American Enlisted Man: The Rank and File in Today's Military* (New York: Russell Sage Foundation, 1970), 147.

¹⁶⁰ The *goal* and *role* concept is central to Manning's argument that psychological needs can affect morale. Manning, "Morale, Cohesion and Esprit de Corps...", 460.

¹⁶¹ Brendan B. McBreen, "Improving Unit Cohesion..."

¹⁶² Stasiu Labuc, "Cultural and Societal Factors...", 487.

roles and accomplishments with the overall purpose of the mission because people needed to know that the traumas they were enduring were for a greater good.¹⁶³

Clearly, a leader can go a long way in fulfilling psychological needs if he simply sets goals and roles for his soldiers, builds their confidence and identity and then validates their personal importance to the mission. By appealing to a soldier's latent ideology, a leader builds morale, improves resiliency and mitigates OSIs.

Strengthening individual resiliency is arguably one of the most effective methods of mitigating OSIs. However, in reviewing the keys to strengthening resiliency - namely unit cohesion and morale - it is important to note that both involve prolonged interaction between leaders and their subordinates. Under ideal conditions, leaders would train with their soldiers prior to deployment, establish a level of preparedness, cohesion and morale, and then deploy as ordered. In the reality this may be a tad optimistic: in many instances, leaders may be assigned either *augmentees* with whom they have no previous affiliation or *replacements* that join the unit in the midst of the deployment.¹⁶⁴

Augmentees represent a unique challenge to military leaders intent on mitigating OSIs. New to the unit, augmentees do not have the benefit of shared experiences and the self-confidence that comes with collective training. As a consequence, augmentees have less time to develop the sense of cohesion and morale that lead to greater resiliency to stress. Because of these factors Thompson and Gignac contend that augmentees are at a greater risk of stress during a mission and point to one study that reported augmentees had lower morale scores than members of a formed unit.¹⁶⁵ Joining a unit in the midst of a mission – as is the case with replacement personnel – poses similar stress risks. While potentially from the same home unit, a replacement may not enjoy the cohesion and morale that comes with collective training and deployment experiences. The result on the individual replacement is a lower resiliency to stress and a correspondingly higher risk to OSIs.

The susceptibility that augmentees and replacements have to stress provides yet another opportunity for military leaders to mitigate OSIs. At the outset, it seems clear that military leaders must establish environments where augmentees and replacements feel part of a supportive and protective team. This begins with many of the fundamentals advanced earlier in this paper: defining the mission and its relevance, identifying the individual's role and goal in the mission, and building the individual's social identity and self-confidence. While this approach will no doubt lead to increased morale and a sense of unit cohesion, it requires time and leadership commitment to have the desired effect. Unfortunately, during the intervening period, augmentees and replacements may be exposed to stressors for which they are not prepared. Thompson and Gignac submit that military leaders must recognize this period of vulnerability and – through positive leadership practices – moderate the impact of stressful experiences through intervention and individualized support.¹⁶⁶ In essence, until such time as replacements and augmentees feel that the unit - peers and leaders alike – is a mutually supportive and protective environment, military leaders must take personal action to convince them of that fact.

¹⁶³ Becker, interview with author...

¹⁶⁴ For the purposes of this paper, an *augmente* is defined as a military member from one unit who is assigned to augment the strength of another unit during a deployment. A *replacement* is defined as a military member who joins a unit in the midst of the deployment phase. A replacement may be from the home unit or from an entirely different unit.

¹⁶⁵ Morale within a unit can be measured using a variety of surveys. One developed by the Canadian Forces Directorate of Human Resources Research and Evaluation is called the Unit Climate Profile. Thompson and Gignac, "A model of psychological adaptation...", 10.

¹⁶⁶ *Ibid.*, 14.

While focusing on cohesion, morale and individual support may work for a small number of augmentees and replacements, this approach becomes increasingly less practical as the numbers increase. In instances in military operations where augmentees and replacements combine to form a large percentage of unit strength, cohesion disintegrates, morale plummets and resiliency to stress is compromised. The United States Army personnel replacement system during World War II and Vietnam illustrates this point. While the system was successful in maintaining stability in unit strength, it cost the US Army in unit cohesion, morale and overall resiliency to combat stress.¹⁶⁷ McBreen attributes the largest surrender in American history – that of the 106th Infantry Division during World War II - to the unfortunate replacement system in place at the time:

... the 106th Infantry Division, totally collapsed in combat with the Germans... None of the units of the division had been given the time, training, or personnel stability to develop even the slightest levels of cohesion. Thousands of men had been rotated in and out while the division tried to prepare for combat. Sixty percent of its soldiers had been used as battle replacements for other divisions... The units of this division were not trained teams, but collections of unrelated men. They did not fight well and disintegrated under the pressure of combat, despite high quality supplies, weapons, and equipment.¹⁶⁸

Of course, decisions related to national personnel policy are made not at the tactical level but at the national level of command. Thus, the issue of augmentees and replacements serves to illustrate that leadership at many levels – including strategic and operational leadership – can have a direct effect on operational stress.

Augmentees and replacements are especially vulnerable to operational stress, and as a consequence, merit a focused strategy from military leaders. While never completely avoidable, strategic leaders must develop personnel replacement policies that aim to minimize the number of augmentees and replacements introduced during operations. Operational level leaders need to influence and remind strategic leaders of the importance of this matter. Moreover, as the level responsible for campaign planning, operational leaders must build cohesion and “morale friendly” rotation plans into the campaign design. Finally, leaders at the tactical level must establish an environment where augmentees and replacements feel part of a supportive and protective team and, when the conditions necessitate, personally intervene to demonstrate their support. If one or more of these roles is fulfilled, leadership can go a long way in mitigating OSIs.

The purpose of any preventive system is to take action in an effort to avert the occurrence of a particular condition. When it comes to OSIs, military leaders have an important and indispensable part to play as *practitioners of preventive care*. Military leaders can practice prevention by screening and selecting personnel and strengthening a soldier’s baseline resiliency through the protective influence of unit cohesion and high morale. In the end, if prevention is practiced, history clearly demonstrates that military leaders can mitigate OSIs.

5.2 Facilitators of Responsive Care

Prevention is often an inexact science and this is certainly true when it comes to OSIs. Regardless of the mechanisms in place, people will experience situations and conditions sufficient to elicit acute and chronic stress reactions as well as more serious stress disorders. In spite of everything that can be done, a military leader’s role as a practitioner of preventive care has limitations. As a consequence, military leaders are obligated to remember one of the fundamental lessons of the history of stress: everyone has a breaking point.

¹⁶⁷ Manning, “Morale, Cohesion and Esprit de Corps...”, 462.

¹⁶⁸ Brendan B. McBreen, “Improving Unit Cohesion...”

It is because everyone, when subjected to sustained military operations, will succumb to operational stress that military leaders must look beyond preventive measures and plan for responsive care. Most military leaders are not doctors thus, there is no expectation to exact professional treatment. Having said this however, military leaders can monitor personnel, assist requests for support and intervene when support is necessary.

Monitoring personnel for OSIs implies that military leaders must know and understand the signs of stress reactions and disorders and the system of care in place to respond to such conditions. Thus, as a prelude to monitoring, it is incumbent upon Commanding Officers to ensure that leaders within their chain of command receive OSI related training. This is an ideal opportunity to bring medical professionals into a unit and conduct what Thompson and Pastò refer to as pre-deployment intervention.¹⁶⁹ By the end of this intervention, everyone in the chain of command - military leaders in particular - should be familiar with the lexicon and science of operational stress.

Armed with a basic knowledge of operational stress, military leaders can play an active role in monitoring the psychological well being of their subordinates. Becker is convinced that close interaction and monitoring of personnel facilitates the early detection of stress related symptoms. He contends that, although everyone has a limit, the objective should be to identify the signs early and well before an individual completely breaks down. During Operation PERSISTANCE this “limit” varied amongst team members but because of the nature of the work, few people lasted more than a couple of weeks before showing signs of psychological stress.¹⁷⁰

Forensic work following the Swiss Air disaster involved sustained exposure to traumatic stressors. As a result, participants tended to succumb to the stress relatively quickly. Other operations may not have the same intensity of traumatic stress but they can still push their participants to their limits. According to Ellard, there was general agreement during World War II that a soldier’s limit was about 90 days after which efficiency began to drop off.¹⁷¹ The principle that everyone has a limit is now well understood. In Canada for example, a typical deployment in a military OOTW lasts between 56 and 180 days and includes a number of planned periods of rest.

Although the overall duration of a mission is important, the point raised by Colonel Becker merits repeating: people can succumb to the stresses of an operation long before the end of a mission and so, the role of leadership is to observe the signs and take action before a breakdown occurs. Sometimes the signs are obvious and the soldier requests assistance. In other situations the leader may observe telltale symptoms. In either case, the military leader’s role is to proffer understanding and then facilitate the receipt of prompt treatment in accordance with the time-honoured military psychiatric principles of proximity, immediacy and expectancy.

According to Thompson and Pastò, this treatment is best provided at a number of levels or echelons of care. First echelon care takes place in or very near the soldier’s unit and involves a temporary break from stressful conditions. The soldier remains in uniform, but gets plenty of rest and warm food. When this first level is insufficient for recovery, a second echelon of care is provided through a Combat Stress Control Unit:

¹⁶⁹ In the pre-deployment phase, intervention involves assistance with screening, briefings and training. OSI briefings include “specifically addressing psychological issues typically ranging from one to four hours. These lectures provide definitions of stress and stressors and outline specific types of deployment stressors, including critical incident stress, chronic stressors, and daily hassles. Stress symptoms are reviewed, and general recommendations for stress reduction including critical incident stress debriefing (CISD) as well as lifestyle management (eating, sleeping, exercise, talking, meditation) are also introduced.” Thompson and Pastò, “Psychological Interventions...”, 226-227.

¹⁷⁰ Becker, interview with author...

¹⁷¹ Ellard, “Principles of Military Psychiatry...”

These units set up as close to the home unit as possible, and service small groups of soldiers who are suffering from psychological stress. Individual counseling [*sic*] and group discussions allow the ventilation of feelings and train coping skills.¹⁷²

Throughout treatment at the first and second levels soldiers are constantly reassured that their condition is a normal reaction to stress and that they can expect to recover and return to their unit. Results from the United States Army suggest that fifty to eighty-five percent of operational stress casualties are restored to active duty within 1 to 3 days of receiving treatment at the first and second echelon.¹⁷³ In the end, a small minority of soldiers with persistent and severe OSIs are evacuated beyond the proximity of their home unit to deep rear area facilities – the third echelon – or homeland care facilities.¹⁷⁴

In the system of responsive care there are number of important roles to be played by military leaders. From the outset, operational level commanders must ensure that first-to-third echelons of treatment are planned, resourced and sustained throughout an operation. At the tactical level, Commanding Officers must ensure that their subordinates are provided a basic knowledge of OSIs. And finally, all leaders at the tactical level must facilitate early intervention through the monitoring and support of their personnel. In the end, effort invested in a system of responsive care based upon the principles of proximity, immediacy and expectancy will go a long way to mitigating OSIs.

Having reviewed the concepts of preventive and responsive care, the notion that military leaders can mitigate OSIs has been well substantiated. Prior to concluding, it is worthwhile to summarize the system of treatment advanced in this paper.

Figure 5, illustrates the system of treatment for *hysteria* and *shell shock* that was common up until 1918. During this period, there was limited focus on individual resiliency to stress and, for the most part, a soldier would rely upon his baseline resiliency to cope with the stressors experienced during the entire deployment cycle. Under this system, soldiers experiencing what are now called OSIs were evacuated to homeland treatment facilities such as civilian hospitals and long-term care asylums. Success rates in these facilities were limited: few soldiers ever returned to their fighting units and many became institutionalized with chronic psychological disorders. It is important to note that during World War II and other military operations up to the mid-1990s, the Canadian military reverted to this system of treatment and suffered similar results.

¹⁷² There is some debate surrounding the actual location of the Combat Stress Control Unit. Thompson and Pastò have suggested co-locating the unit with the nearest field hospital. Boddam however, disagrees with this approach and has suggested a site separate from existing medical facilities to avoid “medicalizing” OSIs. Co-locating the Combat Stress Control Unit with the closest Mobile Laundry and Bath Unit is suggested as an alternative. Thompson and Pastò, “Psychological Interventions...”, 229; and Colonel Randy Boddam, telephone conversation with author, 27 April 2004.

¹⁷³ The United States military also provides for a third echelon of care (Echelon III) not mentioned by Thompson and Pastò in *Psychological Interventions in Peace Support Operations; Current Practices and Future Challenges*. United States, Department of the Army, *Field Manual 8-55 Planning for Health Support Services, Chapter 12-Combat Stress Control Services* (Washington, D.C.: 1994) [public document on-line]; available from <http://www.adtdl.army.mil/cgi-bin/atdl.dll/fm/8-55/Ch12.htm#top>; Internet; accessed 30 January 2004.

¹⁷⁴ Thompson and Pastò, “Psychological Interventions...”, 229.

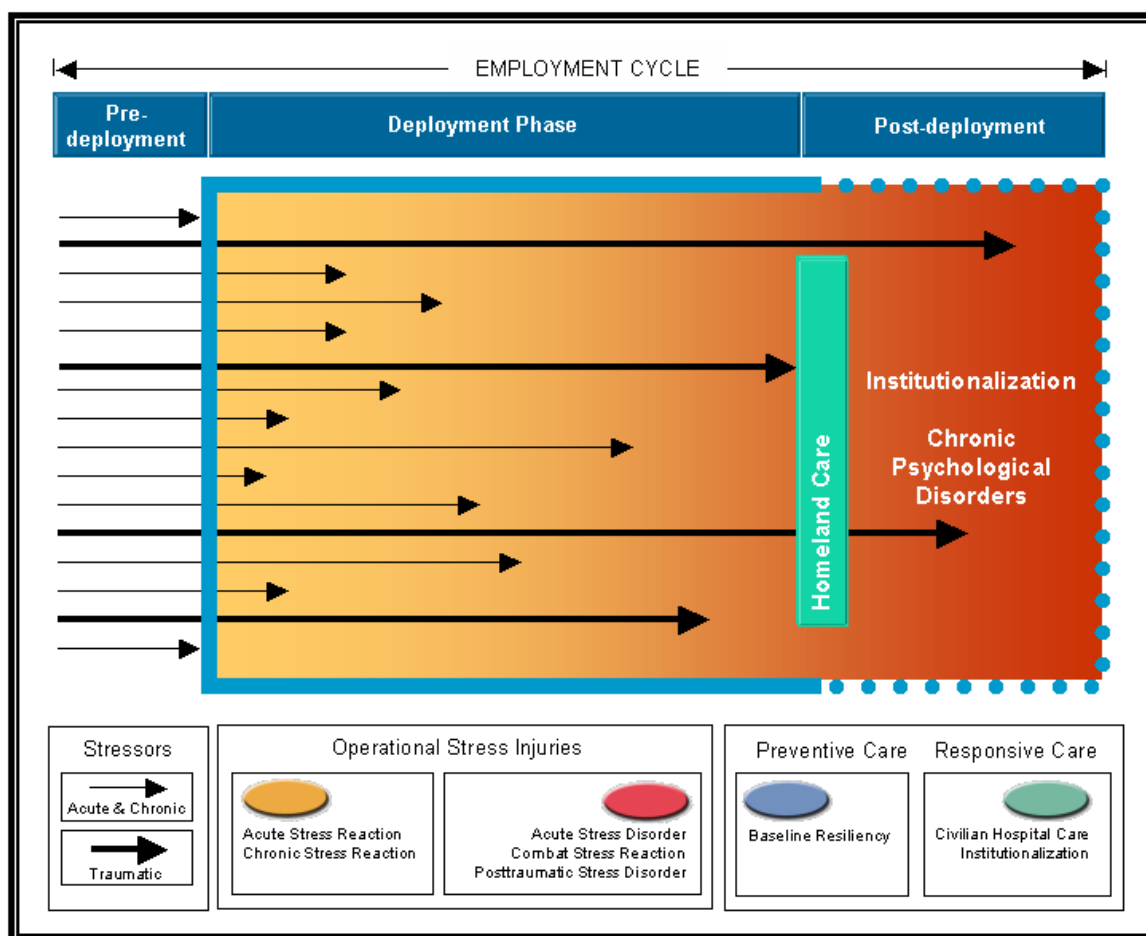


Figure 5: The Pre-1918 System for the Treatment of Operational Stress Injuries.

Figure 6, reflects the system of preventive and responsive care advanced in this paper. Under this system, prevention begins with leadership's commitment to a screening and selection process in the pre-deployment phase that eliminates medically and psychologically unsuitable candidates from the deployment process. Then, by means of improving unit cohesion and morale, military leaders enhance the individual soldier's resiliency to stress throughout the entire employment cycle. Recognizing that prevention is never an absolute and that every soldier has a limit, military leaders ensure that a system of responsive care-based on the enduring principles of proximity, immediacy and expectancy – is planned, resourced and established. Finally, military leaders intervene early and provide subordinates with the understanding and support required for a quick recovery. While there are always exceptions that will require long-term treatment, through the system of preventive and responsive care depicted in Figure 6, military leaders can go a long way in mitigating OSIs.

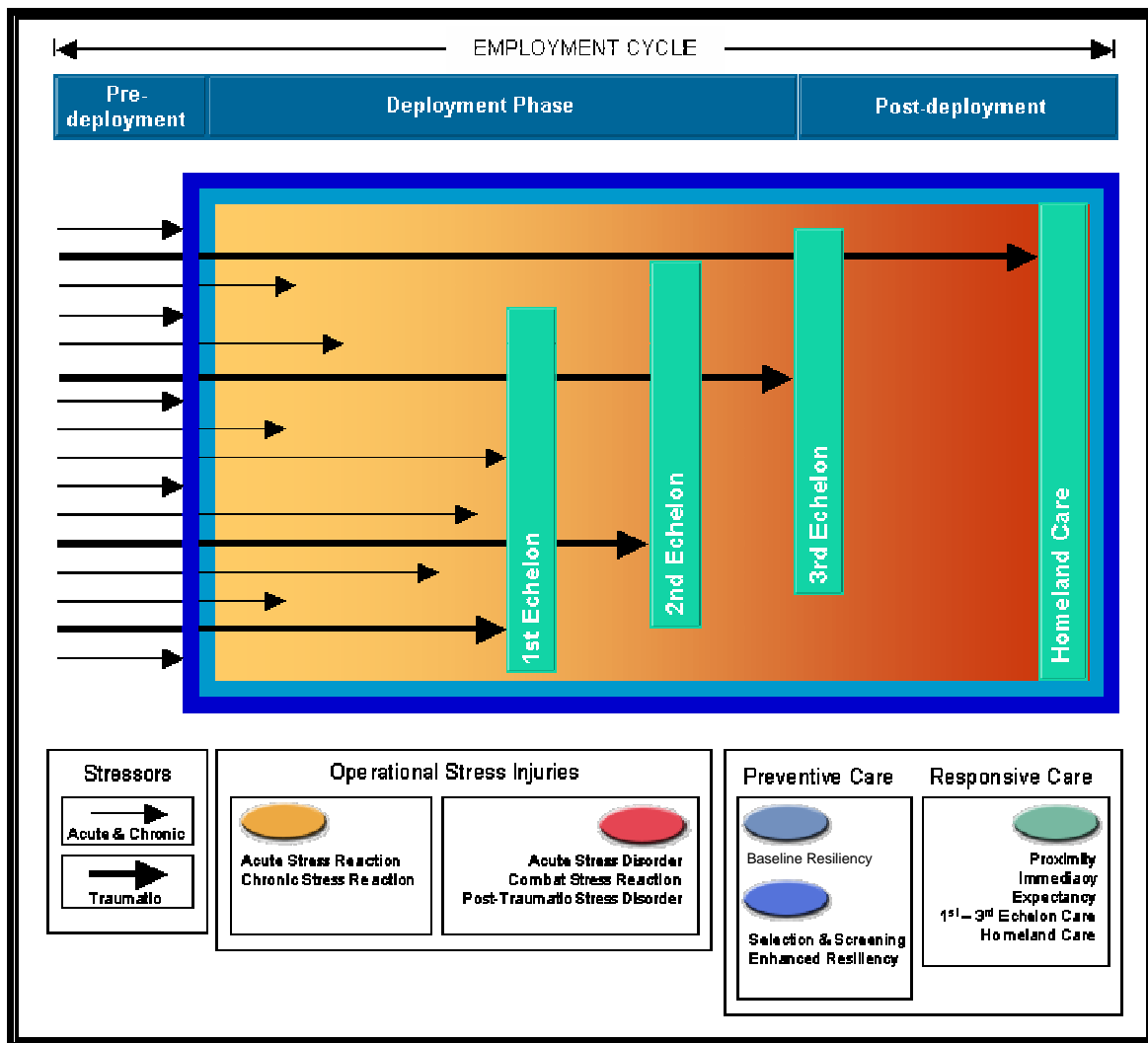


Figure 6: A System of Preventive and Responsive Care for Operational Stress Injuries.

6.0 CONCLUSION

All animals including humans react to actual or perceived threats via an instinctive biochemical response known as fight or flight. This automatic response is designed to prepare an individual to cope with a threatening situation. Ironically, the fight or flight mechanism can elicit physical and mental health problems – referred to throughout this paper as stress injuries - that are also life threatening.

In the traditional conceptualization of stress presented in this essay, the physical and mental health problems that result from the fight or flight response can be categorized under the broad moniker of general stress conditions. While a wide range of stress reactions and disorders exist under this umbrella, this paper focused primarily on acute and chronic stress reactions as well as ASD, PTSD and CSR. The Canadian Forces has its own conceptualization of stress that groups the aforementioned reactions and disorders under the broad term OSI. This term was created, in large part, to recognize that stress related injuries are not restricted to war

fighting. Instead, OSIs can occur throughout the employment cycle of domestic and international military OOTW.

Mankind's present understanding of OSIs developed from centuries of observation, treatment and experimentation that began as early as the agrarian era and developed rapidly in the industrial and information eras. The history of stress as presented in this paper exposed some of the time-honoured misconceptions surrounding operational stress and some of the early and important roles played by military leaders to address what often amounted to a mental health crisis within their organizations. Amongst the many lessons learned, history has proven that everyone has a breaking point in military operations, that victims of OSIs are best treated in accordance with the principles of proximity, immediacy and expectancy, and that a soldier's resiliency to stress can be influenced by the actions of his leaders. Since progress depends on retentiveness, those in positions of leadership would be well served to remember these lessons from the past. Otherwise, as witnessed so many times in history, they are doomed to repeat tragic mistakes.

An assessment of the science behind stress reactions and disorders illustrated that OSIs are a biochemical reaction involving the arousal of the limbic system in the brain and the human sympathetic nervous system. This examination served to further highlight that humans are hard-wired to react to threats and therefore, everyone is susceptible to OSIs.

At the outset, this paper aimed to prove that military leaders can mitigate OSIs through a system of preventive and responsive care. Armed with an understanding of the lexicon, history and science of OSIs, military leaders can do exactly that. To mitigate OSIs, military leaders can act as *practitioners of preventive care*. This involves dedication to a system of prevention that begins with a thorough screening and selection process prior to deployment. A clearly defined (and adhered to) process involving military leaders and medical personnel may serve to identify and remove medically and psychologically unsuitable candidates from the deployment process.

A leader can also prevent OSIs by strengthening an individual's resiliency to stress. This paper proposed that baseline resiliency could be improved by maximizing unit cohesion and individual morale. Unit cohesion can be positively influenced through the sharing of experiences and training, by clearly defining the mission, by validating the mission's relevance and by validating unit accomplishments. High individual morale can be achieved through the development of unit cohesion and providing for the physical and psychological needs of the soldier. This paper showed that attending to the basic essentials of good food, healthcare, clean uniforms, areas of rest and sleep, ablutions and cleaning facilities as well as environmental protection went a long way to addressing a soldier's physical needs. Psychological needs can be met by ensuring that a soldier has both a goal and a role in a mission. By recognizing and rewarding individual accomplishments, military leaders can re-affirm this social identity. In the end, this paper clearly demonstrates that military leaders that properly screen and select personnel for deployment and build resiliency amongst their troops can mitigate OSIs.

Recognizing that every soldier has a limit and prevention is frequently an inexact science, military leaders can also act as *facilitators of responsive care*. Such a system must be based on the enduring principles of proximity, immediacy and expectancy. During operations, military leaders must intervene early and provide subordinates with the understanding and support required for a quick recovery. While there are always cases that will require long-term treatment, military leaders can play an important role in ensuring that the majority of OSI victims recover and return to operations. Thus, through a system of responsive care, military leaders can mitigate OSIs.

As anomalous as it may sound, Canadian military leaders would be remiss if they neglected to recognize the genealogy passed on by Mitochondrial Eve. While fight or flight is essential for survival in military

operations, it also poses an inherent threat to the physical and mental health of soldiers. Military leaders who are mindful of *the paradox of fight or flight*, take an important first step toward mitigating OSIs amongst their personnel.

BIBLIOGRAPHY

- Baard, Erik. "Military Psychiatry Revamps Old Tune: 'Nervous From the Service'." *The Village Voice*. Reference works on-line; available from <http://www.villagevoice.com/issues/0315/baard.php>; Internet; accessed 16 March 2004.
- Baynes, John. *Morale: A Study of Men and Courage*. London: Cassell & Company Ltd., 1967.
- BBCi History. "Shell Shock during World War One." Reference works on-line; available from http://www.bbc.co.uk/history/war/wwone/shellshock_03.shtml#top; Internet; accessed 15 March 2004.
- Binneveld, Hans. *From Shell Shock to Combat Stress*. trans. John O'Kane. Amsterdam: Amsterdam University Press, 1997.
- Boddam, Colonel Randy. *Operations and the Mind*. Presented at the Canadian Forces College, Toronto, August 2003.
- Boeree, C. George. "The Emotional Nervous System." *General Psychology*. Reference works on-line; available from <http://www.ship.edu/~cgboeree/limbicsystem.html>; Internet; accessed 17 March 2004.
- Brown, Ed. "Myers." *Brown University*. Reference works on-line; available from <http://bms.brown.edu/HistoryofPsychiatry/Myers.html#Comment>; Internet; accessed 7 February 2004.
- . "Notes on Nostalgia." *Brown University*. Reference works on-line; available from <http://bms.brown.edu/HistoryofPsychiatry/nostalgia.html>; Internet; accessed 4 February 2004.
- Bryant, Richard A., Anke Ehlers, and Richard J. McNally. "Early Psychological Intervention." *Psychological Science in the Public Interest* 4, no. 2, (November 2003): Journal on-line; available from http://www.google.ca/search?q=cache:GA_Qa6xwbXAJ:www.psychologicalscience.org; Internet; accessed 15 March 2004.
- Canada. Commission of Inquiry into the Deployment of Canadian Forces to Somalia. *Dishonoured Legacy: The Lessons of the Somalia Affair - Volume 1*. Ottawa: Minister of Public Works and Government Services Canada, 1997.
- . Department of National Defence. B-GG-005-004/AF-000 *Canadian Forces Operations*. Ottawa: DND Canada, 2000.
- . Department of National Defence. B-GG-005-027/AF-021 *The Law of Armed Conflict at the Operational and Tactical Level*. Ottawa: DND Canada, 2001.
- . Department of National Defence. *Operation ASSISTANCE*. Ottawa: Assistant Deputy Minister (Public Affairs), 2002. Public document on-line; available from http://www.forces.gc.ca/site/Operations/assistance_e.asp; Internet; accessed 14 March 2004.

- . . Department of National Defence. *Operation PEREGRINE*. Ottawa: Assistant Deputy Minister (Public Affairs), 2002. Public document on-line; available from http://www.forces.gc.ca/site/Operations/Peregrine/index_e.asp; Internet; accessed 14 March 2004.
- . . Department of National Defence. *Operation PERSISTENCE*. Ottawa: Assistant Deputy Minister (Public Affairs), 2002. Public document on-line; available from http://www.forces.gc.ca/site/operations/persistence_e.asp; Internet; accessed 14 March 2004.
- . . Department of National Defence. *Operation RECUPERATION*. Ottawa: Assistant Deputy Minister (Public Affairs), 2002. Public document on-line; available from http://www.forces.gc.ca/site/Operations/recuperation_e.asp; Internet; accessed 14 March 2004.
- . . Department of National Defence. *Operations: Past Operations*. Ottawa: Assistant Deputy Minister (Public Affairs), 2004. Public document on-line; available from http://www.forces.gc.ca/site/operations/past_ops_e.asp; Internet; accessed 19 March 2004.
- . . Department of National Defence. *Queen's Regulations and Orders for the Canadian Forces, Volume 1-Administration, Chapter3-Rank, Seniority, Command and Precedence, Section 1-Rank and Seniority, Article 3.01 (1)*. Ottawa: Assistance Deputy Minister Finance and Corporate Services, 2003. Public document on-line; available from http://www.forces.gc.ca/admfincs/subjects/qr_o/vol1/ch003_e.asp#3.01; Internet; accessed 18 March 2004.
- . . Department of National Defence. *Queen's Regulations and Orders for the Canadian Forces, Volume 1-Administration, Chapter4-Duties and Responsibilities of Officers, Section 5-Responsibilities of a Commanding Officer, Article 4.20*. Ottawa: Assistance Deputy Minister Finance and Corporate Services, 2003. Public document on-line; available from http://www.forces.gc.ca/admfincs/subjects/qr_o/vol1/ch003_e.asp#3.01; Internet; accessed 18 March 2004.
- . . Department of National Defence. *Special Report: Systemic Treatment of CF Members with PTSD*. Ottawa: Ombudsman, 2001.
- . . Veteran Affairs Canada. *VAC Clients – Filling the Gaps at The Centre*. Ottawa: Veteran Affairs Canada, 2003. Public document on-line; available from <http://www.vac-acc.gc.ca/clients/sub.cfm?source=forces/cfcentre>; Internet; accessed 4 February 2004.
- Canadian Broadcasting Corporation*. “The National - The Unseen Scars - Post Traumatic Stress Disorder.” Reference works on-line; available from <http://www.tv.cbc.ca/national/pgminfo/ptsd/wounds.html>; Internet; accessed 14 March 2004.
- Columbia Encyclopedia*. “French Revolutionary Wars.” Reference works on-line; available from <http://www.bartleby.com/65/fr/FrenchReWr.html>; Internet; accessed 7 February 2004.
- Coop, Terry and Bill McAndrew. *Battle Exhaustion: Soldiers and Psychiatrists in the Canadian Army, 1939-1945*. Montreal: McGill-Queen's University Press, 1990.
- Dallaire, Roméo. *Shake Hands with the Devil – The Failure of Humanity in Rwanda*. Toronto: Random House of Canada Ltd., 2003.

- Ellard, John. "Principles of Military Psychiatry." *ADF Health* 1, no. 2 (April 2000): Journal on-line; available from http://www.google.ca/search?q=cache:IrUMhcde68cJ:www.defence.gov.au/dpe/dhs/infocentre/publications/journals/NoIDs/ADFHealthApr00/ADFHealthApr00_1_2_8184.pdf+principles+of+military+psychiatry+%2B+john+ellard&hl=en&ie=UTF-8; Internet; accessed 14 March 2004.
- English, Allan D. "Historical and Contemporary Interpretations of Combat Stress Reaction," Dissertation, Royal Military College, 1999.
- . "Leadership and Operational Stress in the Canadian Forces." *Canadian Military Journal* 1, no. 3 (Autumn 2000): 33-38.
- EnglishOpenAccess*. "Survivors." Reference works on-line; available from http://www.stevebrown.clara.net/html/expeience_of_war/sassoon_survivors.htm; Internet; accessed 15 March 2004.
- Franke, Volker C. "The Social Identity of Peacekeeping." In *The Psychology of the Peacekeeper – Lessons from the Field*, ed. Thomas W. Britt and Amy B. Adler, 31-51. Westport: Praeger Press, 2003.
- Frey, Rebecca J. "Stress." *HealthAtoZ Encyclopedia*. Reference works on-line; available from <http://www.healthatoz.com/healthatoz/Atoz/ency/stress.html>; Internet; accessed 12 March 2004.
- Gabriel, Richard A. "Soviet Military Psychiatry." In *Military Psychiatry: A Comparative Perspective*, ed. Richard A. Gabriel, 67-117. New York: Greenwood Press, 1986.
- Ithaca College*. "Cognitive Dissonance." Reference works on-line; available from <http://www.ithaca.edu/faculty/stephens/cdback.html>; Internet; accessed 28 April 2004.
- Kimball, John W. "Organization of the Nervous System." *Kimball's Biology Pages* Reference works on-line; available from <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/P/PNS.html>; Internet; accessed 17 March 2004.
- Knibb, Rebecca. *Health Psychology: Stress and Coping*. Presented at the University of Derby Institute of Behavioural Sciences, Derby. Presentation on-line; available from <http://www.google.com/u/ibs?domains=ibs.derby.ac.uk&q=cannon&sa=Go&sitesearch=ibs.derby.ac.uk>; Internet; accessed 16 March 2004.
- Labuc, Stasiu. "Cultural and Societal Factors in Military Organizations." In *Handbook of Military Psychology*, ed. Reuven Gal and A. David Mangelsdorff, 471-489. Chichester: John Wiley & Sons Ltd., 1991.
- Lambert, Craig. "Hypochondria of the Heart." *Harvard Magazine* 104, no. 1 (September-October 2001): Journal on-line; available from <http://www.harvard-magazine.com/on-line/0901214.html>; Internet; accessed 4 February 2004.
- Manning, Frederick J. "Morale, Cohesion and Esprit de Corps." In *Handbook of Military Psychology*, ed. Reuven Gal and A. David Mangelsdorff, 453-470. Chichester: John Wiley & Sons Ltd., 1991.
- Mapleleafweb*. "Canada and peacekeeping: A history of Canada's participation." Reference works on-line; available from http://www.mapleleafweb.com/features/military/peace_keeping/history.html; Internet; accessed 16 March 2004.

- Martin-Ford, Paula. "Stress." *Gale Encyclopedia of Alternative Medicine*. Reference works on-line; available from <http://www.findarticles.com/g2603/0006/2603000686/p1/article.jhtml>; Internet; accessed 16 March 2004.
- McBreen, Brendan B. "Improving Unit Cohesion: The First Step in Improving Marine Corps Infantry Battalion Capabilities," Dissertation, Marine Corps Fellowship Program, 2002. Unpublished material on-line; available from <http://www.2ndbn5thmar.com/coh/iuc.htm>; Internet; accessed 20 March 2004.
- McEwen, Bruce S. and Elizabeth Norton Lasley. *The End of Stress as We Know It*. Washington, D.C.: The Dana Press, 2002.
- Middlesex University. "Jean Martin Charcot and Blanche Wittman." Reference works on-line; available from <http://www.mdx.ac.uk/www/study/ycharcot.htm>; Internet; accessed 7 February 2004.
- Moran, Lord. *Anatomy of Courage*. London: Constable & Company Ltd., 1945.
- Moskos, Charles C. *The American Enlisted Man: The Rank and File in Today's Military*. New York: Russell Sage Foundation, 1970.
- NCERx Health Sites. "Stress and Health." Reference works on-line; available from <http://www.stress-and-health.com/index.php3>; Internet; accessed 7 February 2004.
- Noy, Shabtai. "Combat Stress Reactions." In *Handbook of Military Psychology*, ed. Reuven Gal and A. David Mangelsdorff, 507-530. Chichester: John Wiley & Sons Ltd., 1991.
- Off, Carol. *The Lion, The Fox and the Eagle: A Story of Generals and Justice in Yugoslavia and Rwanda*. Toronto: Random House Canada Ltd., 2000.
- Office of the Judge Advocate General. "1945 Charter of the United Nations." In *Collection of Documents on the Law of Armed Conflict*, 2001 ed., ed. Directorate of Law Training, 56-66. Ottawa: DND, 2001.
- Operational Stress Injury Social Support. "OSI Official Definition." Reference works on-line; available from http://www.osiss.ca/engraph/OSI_Official_e.asp; Internet; accessed 19 March 2004.
- Panzarino, Peter J. "Stress." *MedicineNet*. Reference works on-line; available from <http://www.medicinenet.com/Stress/article.htm>; Internet; accessed 13 March 2004.
- Press, Joy. "Shell Shock and Awe." *The Village Voice*. Reference works on-line; available from <http://www.villagevoice.com/issues/0315/press.php>; Internet; accessed 26 April 2004.
- PSYweb. "Acute Stress Disorder." Reference works on-line; available from <http://www.psyweb.com/Mdisord/AnxietyDis/asd.html>; Internet; accessed 4 February 2004.
- . "Depersonalization." Reference works on-line; available from <http://www.psyweb.com/Diction/deperson.html>; Internet; accessed 4 February 2004.
- . "Derealization." Reference works on-line; available from <http://www.psyweb.com/Diction/dereal.html>; Internet; accessed 4 February 2004.

- . “Dissociative Disorders.” Reference works on-line; available from <http://www.psyweb.com/Mdisord/dissd.html>; Internet; accessed 4 February 2004.
- . “Hypervigilant.” Reference works on-line; available from <http://www.psyweb.com/Diction/hypervi.html>; Internet; accessed 4 February 2004.
- . “Posttraumatic Stress Disorder” Reference works on-line; available from <http://www.psyweb.com/Mdisord/AnxietyDis/posttraumatic.html>; Internet; accessed 4 February 2004.
- Regehr, Cheryl, David Hemsworth and John Hill. “Individual Predictors of Posttraumatic Distress: A Structural Equation Model.” *The Canadian Journal of Psychiatry* 46, (2001): Journal on-line; available from <http://www.cpa-apc.org/Publications/Archives/CJP/2001/Mar/Individual.asp>; Internet; accessed 15 October 2003.
- Shephard, Ben. *A War of Nerves: Soldiers and Psychiatrists in the Twentieth Century*. Cambridge: Harvard University Press, 2001.
- Solomon, Zahava. *Combat Stress Reaction: The Enduring Toll of War*. New York: Plenum Press, 1993.
- Strecker, Edward A. and Kenneth E. Appel. *Psychiatry in Modern Warfare*. New York: The Macmillan Company, 1945.
- The Clinical Research Unit for Anxiety and Depression*. “Acute Stress Reaction.” Reference works on-line; available from http://www.crufad.org/self_help/trauma-level2.htm; Internet; accessed 12 March 2004.
- The War Scholar*. “A Summarized History of the Development of Military Technology.” Reference works on-line; available from <http://www.warscholar.com/Year/TechnologyOutline.html>; Internet; accessed 5 March 2004.
- Thompson, Megan M. and Luigi Pastò. “Psychological Interventions in Peace Support Operations: Current Practices and Future Challenges.” In *The Psychology of the Peacekeeper – Lessons from the Field*, ed. Thomas W. Britt and Amy B. Adler, 223-241. Westport: Praeger Press, 2003.
- Thompson, Megan M. and Monique A.M. Gignac. “A model of psychological adaptation in Peace Support Operations: An Overview.” Technical Report, Defence and Civil Institute of Environmental Medicine, 2001.
- Toffler, Alvin and Heidi Toffler. *War and Anti-war: Survival at the Dawn of the 21st Century*. Boston: Little, Brown & Company Ltd., 1993.
- Town, R.R. “The Effect on Sustainment of Stress in Operations.” Toronto: Canadian Forces College Advanced Military Studies Course Paper, 1999.
- United States. Department of the Army. *Field Manual 8-55 Planning for Health Support Services, Chapter 12-Combat Stress Control Services*. Washington, D.C.: 1994. Public document on-line; available from <http://www.adtdl.army.mil/cgi-bin/atdl.dll/fm/8-55/Ch12.htm#top>; Internet; accessed 30 January 2004.

USA Today World. “1991 Gulf War chronology.” Reference works on-line; available from <http://www.usatoday.com/news/index/iraq/nirq050.htm>; Internet; accessed 16 March 2004.

Wallace, Scott. “What is Stress.” *Virtual Psych*. Reference works on-line; available from <http://www.geocities.com/HotSprings/2987/oldsite4/whatisstress.htm>; Internet; accessed 10 March 2004.

Wikipedia. “Evolution of Homo sapiens.” Reference works on-line; available from http://en.wikipedia.org/wiki/Human_evolution#Neanderthal_Man; Internet; accessed 7 March 2004.

———. “Mitochondrial DNA.” Reference works on-line; available from http://en.wikipedia.org/wiki/Mitochondrial_DNA; Internet; accessed 7 March 2004.

———. “Mitochondrial Eve.” Reference works on-line; available from http://en.wikipedia.org/wiki/Mitochondrial_Eve; Internet; accessed 7 March 2004.

———. “Siegfried Sassoon.” Reference works on-line; available from http://en.wikipedia.org/wiki/Siegfried_Sassoon; Internet; accessed 26 April 2004.

Wikiquote. “George Santayana (1863-1952).” Reference works on-line; available from [http://quote.wikipedia.org/wiki/George_Santayana#The_Life_of_Reason_\(1905\)](http://quote.wikipedia.org/wiki/George_Santayana#The_Life_of_Reason_(1905)); Internet; accessed 18 March 2004.

Zentner, John J. “The Art of Wing Leadership: Exploring the Influences of Aircrew Morale in Combat.” Thesis, Air University School of Advanced Airpower Studies, 2000.